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PRIDE

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ALBERTA

- A Teachers Handbook on the Agriculture Industry.

GRADES 4, 5, & 6

Alberta
AGRICULTURE

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INTRODUCTION

The Alberta agriculture industry has a fascinating history. It is essential to the present and the outlook for the future is unlimited. Food production is an integral part of our everyday lives. We can not ignore its importance.

Teaching about agriculture is a simple task. Most children enjoy learning about animals, nature and above all, they love food.

This handbook is designed to inspire and encourage teachers to discover agriculture through classroom activities. It provides informative and practical activities to assist in the planning of meaningful learning experiences. The multi-disciplinary lessons have been designed to support educational concepts included in the existing Alberta curriculum.

We hope you will accept our invitation to explore agriculture through participation in these activities. We are confident it will be a wonderful experience for you and your students. All or parts of this handbook may be reproduced for use in the classroom.

Find out about the homesteaders, understand agribusiness today, speculate about the future of our food production. Alberta agriculture is for everyone.

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CREDITS

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Alberta
AGRICULTURE

Where to Find It

Curriculum Related Lessons — Page

1. Latest and Greatest: 1.1
   - Students invent and build farm equipment.
2. Energy Conversion: 2.1
   - Discover how farming relates to the food chain.
3. Cultivation vs. Grazing: 3.1
   - Evaluate agricultural land and recommend best land use strategies.
4. Looking Through Different Eyes: 4.1
   - Become an Alien Reporter
5. Pioneers and Places I: 5.1
   - A family makes plans to homestead in Alberta.
6. Pioneers and Places II: 6.1
   - Choose a homestead for your pioneer family.
7. Pioneers and Places III: 7.1
   - Remember the first winter on the homestead.
8. Natural Food Production: 8.1
   - For or Against. Debate the issue of Organic or Conventional Farming.
9. Learning the Language: 9.1
   - Build vocabulary by doing the Agricultural Terms Crossword puzzle.
10. Power: 10.1
    - Evaluate agricultural power sources. Are they renewable?
11. Alberta-Asia Agricultural Links: 11.1
    - Compare Alberta to her sister Asian provinces.
12. Weather or Not: 12.1
    - Play the game of weather.
13. Erosion, Soil Loss - Farming Techniques: 13.1
    - Fight erosion in your area.
14. Irrigation: 14.1
    - Build a working irrigation system.

15. Environment or Adaptation: 15.1
- Categorize farm management practices.

16. People, Natural Resources and Independence: 16.1
- Evaluate the degree of independence of various families.

17. Future of the Family Farm: 17.1
- Role play in a modern farm family dilemma.

18. Our Heritage, Our Future: 18.1
- Predict future developments in agriculture technology.

19. International Supper: 19.1
- Discover the origins of the food you eat.

20. Agriculture In The News: 20.1
- Read all about it.

INDEPENDENT ACTIVITIES

21. Discover Dairying 21.1

22. Fun Facts 22.1

23. The Agribusiness Game 23.1

24. Math Teasers 24.1

RESOURCE GUIDE

Page

Mechanization of Alberta Farms 1.5

Factors that Influenced the Acceptance of Modernization on Farms in Alberta 1.7

Equipment on Alberta farms 1931 - 1981 1.8

Tractor Sales in the Prairie Provinces 1919 - 1956 - Bar Graph 1.15

From Seed to Feed - Flow Chart - 2.9

Food Chain Flow Chart 2.10

Farming and the Food Chain 2.11

Factors Related to Agricultural Land Use 3.8

Ecoregions of Alberta 3.9

Soil Groups or Zones 3.17

Soil Map 3.19

Acreages of CLI Soil Subclasses in Alberta 3.20

Homesteading in Alberta 5.8

Pioneer Possessions 5.11

Interesting Facts (Early Settlement) 5.12

Ecoregions of Alberta (Map) 6.6

Settlement Areas 1891 - 1921 (Map) 6.7

Early Development in Alberta (Map) 6.8

What is in the Food We Eat (Essay) 8.8

A Hungry World Demands Food (Essay) 8.9

Back to the Basics (Essay - Organic Farming) 8.10

Modern Food Production (Essay) 8.12

Learning the Language - Vocabulary 9.4

Farm Power Compared 10.5

Butter Production Process 1900 or 1985 10.8

The Asia Alberta Exchange 11.7

Drought and Despair (Essay) 13.5

Men Against The Desert (Essay) 13.7

Irrigation in Alberta 14.6

Dairy Cow Adaptations 15.5

Dairying in Canada (Time Line) 21.1

Alberta Dairy History (Time Line) 21.4

FURTHER INFORMATION

Settlement FI-1

Farmland and Forest Areas (Table) FI-3

The Climate FI-4

Fertilizer and Herbicides FI-7

Soil Conservation FI-8

Rural Population and Farm Sizes (Table) FI-9

Net Value of Production in Commodity Producing Industries, Alberta and Canada, 1973 FI-10

Agriculture and the Provincial Economy FI-13

Land Ownership in Alberta FI-18

History of Legislation which affects the Land use in Alberta FI-19

Curriculum

Connection

The Curriculum Connection

SUBJECT	CURRICULUM CONNECTION	MAJOR CONCEPTS
Social Studies	Alberta, Past, Present, Future Our Human Resources	Change, resourcefulness, lifestyle, occupations
Social Studies	Alberta, Past, Present, Future Our Natural Resources	The effect of climate and geography on agricultural land use.
Social Studies	Alberta, Past, Present, Future - How people in earlier times met their needs - Major factors that influenced settlement - Transportation - Natural resources.	Development, growth, change, resourcefulness, lifestyle
Social Studies	How People In Eastern Societies Meet Their Needs Today - International Agencies	Cross-cultural sharing customs and Traditions Perspective.
Social Studies	Alberta, Past, Present, Future Natural Resources, Human Needs Alberta's Links with Canada and the World Trade, Self-sufficiency, Interdependence. How People in Earlier Times Met Their Needs Basic Needs	Independence is related to access to natural resources.
Social Studies	Alberta, Past, Present, Future Technology Canada Industrial Development From Region To Region Industry, Standard of living, employment	

The Curriculum Connection

RELATED SUBJECT SKILLS	GRADE LEVEL LESSON	PAGE
Art, Language Arts,	Grade 4+ Lesson #1 "The Latest and the Greatest"	1.1
Language Arts, Science (Soil)	Grade 4+ Lesson #3 "Cultivation vs. Grazing"	3.1
Drama,Language Arts, Art	Grade 4+ Lesson #5, #6, & #7 "Pioneers and Places"	5.1 6.1 7.1
Language Arts - Research Skills	Grade 6 Lesson #11 "Alberta - Asia Agriculture Links"	11.1
Language Arts	Grade 4 and 6 Lesson #16 "People, Natural Resources and Independence"	16.1
Language Arts	Grade 4 and 5 Lesson #18 "Our Heritage, Our Future"	18.1

The Curriculum Connection

SUBJECT	CURRICULUM CONNECTION	MAJOR CONCEPTS
Social Studies	Alberta's Link with Canada and the World	Trade
Science	Matter and Energy changes in matter Energy Resources	Conservation Food Chains
Science	Matter and Energy Energy Resources and Conservation	Energy sources guide industrial and technical developments.
Science	Earth, Space and Time Weather patterns, measuring and predicting weather conditions which influence our lives.	Weather influences agricultural production.
Science	Earth, Space and Time Water and Land	Cause and control of erosio
Science	Earth, Space and Time Water and Land.	The relationship of land productivity to Soil and Wat Plants require water.
Science	Living Things and Environment Environmental Factors Adaptation.	The use of adaptation and modification of environment in food production.

The Curriculum Connection

RELATED SUBJECT SKILLS	GRADE LEVEL LESSON	PAGE
Art,	Grade 4+ Lesson #19 "International Supper"	19.1
Language Arts	Grade 4+ Lesson #2 "Energy Conversion"	2.1
Social Studies	Grade 4+ Lesson #10 "Power"	10.1
Math - Long Multiplication, Language Arts	Grade 4+ Lesson #12 "Weather or Not" Game	12.1
Language Arts - Reading for information	Grade 4+ Lesson #13 "Erosion, Soil Loss and Farming Techniques"	13.1
Art, Building and Construction	Grade 4+ Lesson #14 "Irrigation"	14.1
Language Arts	Grade 4+ Lesson #15 "Environment or Adaptation?"	15.1

The Curriculum Connection

SUBJECT	CURRICULUM CONNECTION	MAJOR CONCEPTS
Language Arts	Creative Writing and Observation.	Regions Industry
Language Arts	Reading Comprehension Speech Development	Forming opinions
Language Arts	Building Vocabulary Dictionary Skills	Communication skills improve with expanded vocabulary.
Language Arts	Development of Speaking Skills Oral Expression	Explanations, preferences, feelings, judgements, emotions predictions.
Language Arts	Reading For Information	The media as an information source.

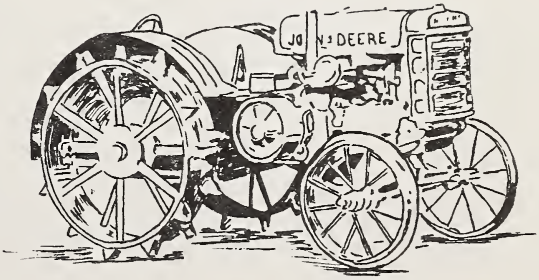
The Curriculum Connection

RELATED SUBJECT SKILLS	GRADE LEVEL LESSON	PAGE
Social Studies	Grade 4 Lesson #4 "Looking Through Different Eyes"	4.1
Science	Grade 5+ Lesson #8 "Natural Food Production, For or Against"	8.1
Crossword Puzzle	Grade 4+ Lesson #9 "Learning the Language"	9.1
Drama, Role Playing, Social Studies: change	Grade 5+ Lesson #17 "The Future of the Family Farm"	17.1
Social Studies	Grade 4+ Lesson #20 "Agriculture in the News"	20.1

Lesson 1

LATEST AND GREATEST?

Subject Area:	Social Studies
Curriculum Direction:	Alberta, Past, Present. Future - our human resources Albertan's adjust their life style to meet new opportunities and challenges.
Major Concepts:	Change, resourcefulness, lifestyle, occupations.
Lesson Concept:	The world is in a constant state of change. Technological innovations respond to changing needs while at the same time creating a need for change.
Purpose:	- To develop the concept of change through the study of mechanization on Alberta farms. - To explore the future possibilities of advanced technology in Agriculture. - To experience a problem solving situation.
Materials Requested:	Art supplies, miscellaneous building supplies. Optional - tape recorder, or video camera.
Time Required:	2 - 5 class periods.



To The Teacher

The time required to complete this lesson has been left to your discretion. The complete exercise could involve a good measure of class and home study time. While the concepts are clearly outlined in the social studies curriculum, the skills required include those from the language arts, drama and art disciplines.

The objective of this lesson is to get the students actively involved in creating a new product which they must market to the rest of the class.

PROCEDURE:

Part 1

Introduction:

Introduce the concept of change through a class discussion. Review the history of farm mechanization and how it is a good illustration of a factor which created a change in Alberta's history.

Using the resource supplied, review the development of farm machinery. Three areas of the history should be emphasized.

1. The types of tractors introduced and some of their features.
2. The effects the mechanization had on the industry.
3. The human element of change
   a) attitudes to change
   b) the ripple effects of major changes
   c) the impact of mechanization on rural lifestyles.

Part 2

Problem Solving:

1. Divide the class into groups and challenge them to invent a new or renovated machine to do a simple farm chore.

   a) There are jobs that are done in the class room.
   (e.g. sharpen pencils)

   b) Discuss various jobs that are done on a farm.
   (e.g. ploughing, threshing, feeding livestock)

Conclusion:

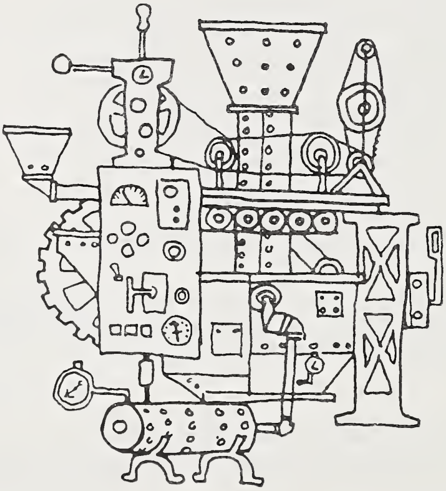
Review the exercise. Have the students present their marketing schemes. Follow up with a discussion.

1. Were the inventions superior to existing machines?
2. Did the implement require extensive change in the part of the buyer in order to be utilized?
3. Could some of the inventions revolutionize the industry?

4. Were the inventions based on previous models or were they a totally new idea?
5. How did the class respond to the advertising campaign? Is this typical of most people?

Related Activity:

1. Take a trip to a local museum
2. Visit a small town fair
3. Visit a farm to view the range and age of machinery in use
4. Write to an implement dealer for information on their latest machinery line.



Concept 1: We use machines to help us do jobs.

- Pencil sharpeners are used to sharpen pencils.
- Tractors are used to help with farm work.

We now have electric pencil sharpeners. Not every one has one. Many of us still use a hand sharpener.

There are very advanced tractors working on farms too, but not everyone has one.

Concept 2: When we make changes we sometimes keep a part of the past while starting to accept new things.

Part 3

Construction of a Model:

Have the students build or draw their inventions. Have the students demonstrate the completed models. Be sure to include such information as materials and operation directions.

Part 4

Marketing:

Ask the groups to create advertisements to sell their inventions.

Some suggested selling techniques may be:

- Role play. Door to door salesman.
- Posters or print ads.
- Radio commercials done on a tape recorder.
- T.V. commercial done on a video tape.

Mechanization of Alberta Farms

Farm tractors provided the technology which revolutionized the industry and stimulated human resourcefulness resulting in a dynamic sequence of change.

The first gasoline tractors were built in the 1880's. They did not gain general acceptance for many years. Economical, mechanical and political problems hindered the replacement of draft animals by machines.

> "For the ordinary grain farmer, the gasoline tractor was an interesting experiment which he followed in the pages of the Grain Grower's Guide or the Farmer's Advocate, not something in which he would invest $1700 (the price of the cheapest model entered in the 1909 Winnipeg competition). Those few who had the courage or the foolhardiness to do some of the experimenting on their own farms soon discovered that gasoline tractor engineering was still in its infancy. Primitive electrical systems meant that starting was complicated and uncertain - Hart Parr's 1910 manual listed nineteen steps for starting the engine - and a popular joke lampooned the tractor farmer who left his machine running all night during seeding rather than risk a restart the next morning. Drive gears were not enclosed and were made of cast iron so that dust and dirt caused rapid wear in dry weather. Heavy steel wheels, sometimes six and eight feet in diameter, made tractor field work impossible when the weather was wet. Breakdowns were common, costly, and time-consuming. When broken crankshafts, warped clutches, dead magnetos, burned-out bearings, or faulty plugs put a machine out of action, parts were difficult to obtain. Throughout Canada and the United States scores of independent manufacturers tried to turn out tractors for farm use and few stayed in business long enough to establish reliable parts networks".1
>
> "It was in the early nineteen-twenties that the first modern tractors came on the market. Equipped to deliver power through drawbar, belt pulley and power take-off, and with their enclosed gears, automotive type steering and better protection from dust, they paved the way for more attractive and efficient operation".
>
> Then in the thirties, came the rubber-tired tractors with their higher speed operation and lower operating costs. This higher speed meant machinery to suit. The old implements, designed for the pace of the team, were not sufficiently durable for the stress placed upon them by this new power change. The result was the opening of a whole new field, and a challenge to the ingenuity of that rapidly expanding group of professionals, the agricultural engineers.

So the one-way succeeded the plow and the combines followed the binder, while in the field of haying machinery many changes were to occur. Then too, motor trucks, grain loaders and grain cleaners all helped to reduce the farmer's chores and allow more efficient use of his limited, busy-season time.

But the story of farm mechanization in Alberta and the west has not been one of steady progression. During depression and unemployment there was little demand for farm mechanization; but the labour shortage of the war years, and the now growing need for products of the farm, have resulted in a steadily increasing demand for better and still better equipment.

Although, in the mid 1920's the tractor was coming more and more into use for general farm work, it was as yet by no means accepted by the majority of farmers. "Farmers are finding it more economical to work their lands with horses than with tractors," said the Livestock Commissioner in 1924. "And," he continued, "while there is a place for the tractor on the large farm, it will only be used in conjunction with horses".

But the tractor was gaining favour and by 1928, since the work could be done much more quickly, more and more tractors were appearing on the farms. Economically, however, the horse remained in favour, and this showed strongly when in the 1930's the dark clouds of depression gathered. But shortly before this, the sale of tractors was heavy, and some firms were trading tractors for horses and shipping the horses east. Still, said the horse lover, there will remain a demand for good farm horses, since the tractor can not entirely replace the horse on Alberta farms.

And when in 1930, effects of the depression began to be felt, there seemed to be some truth in their assertion. With the low price of wheat and the high price of gasoline and oil, the horse for farm use was again in favour. "The farmers of late years have been relying on motor power" said the Livestock Commissioner in 1931, "and therefore have not been raising many colts. In the past year a great many were forced back into using horses, and this created considerable demand."

As late as 1938 we find the Alberta Department of Agriculture advising: "The demand is still growing, even though gradually, for draft horses for farm work. This is possibly due to the steady migration of settlers from the south-eastern section of the province (most recently known as the drought area) to the northern part of the province, where in many cases, these settlers are now using horses in place of their previously used farm tractors and machinery, which have now become worn and depleted, and also to the fact that the smaller land holdings are more adapted to horse work," It was not until the war years with their demand for increased production and their farm labour shortage that the tractor again became the prime motive power on the farm.

Power machinery for field use does not of course tell the whole story of farm mechanization. Electricity on the farm and the labour saving devices of dairying, and stock raising are a far cry from pioneer days, or from even the more advanced type of agriculture practiced in Alberta twenty years ago.[2]

1. Alberta Agriculture Historical Review
   E.B. Swindlehurst 1967

2. "The Adoption of the Gasoline Tractor in Western Canada"
   Robert E. Ankli, H. Dan Heisbert, John Herd Thompson, 1980.

FACTORS THAT INFLUENCED THE ACCEPTANCE OF MODERNIZATION ON FARMS IN ALBERTA

1. Ability to purchase	1. Farm product prices must be sufficient to warrant investing in new machinery. 2. Yields must be sufficient to receive good profit after payment of capital expenditures.
2. General economy	1. The availability of credit. 2. Effects of the depression 1930's.
3. The personal need	1. Shortage of man power - war years. 2. Costly labour.
4. Mechanical reliability	1. Early tractors were unreliable and parts were often unavailable. Farmer's mechanical ability was not advanced enough to do simple repairs.
5. Efficiency of the new methods as compared with traditional methods	1. Many studies were done to compare the cost of tractor farming to work done by horses.
6. The effects of major world events.	1. The great Depression - (see chart) 2. World War II - (see chart)

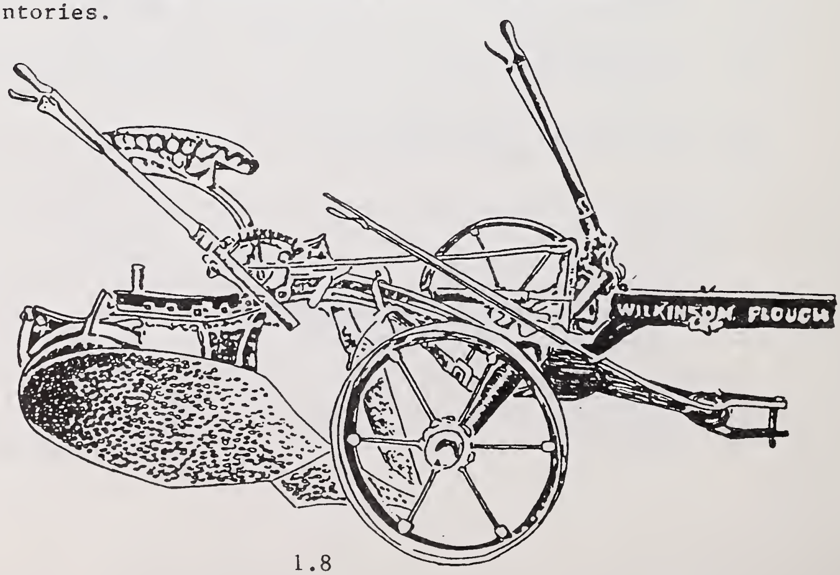
Equipment on Alberta Farms 1931-1981

	1931	1956	1981
Tractors	23,985	94,156	124,214
Binders	73,487	45,200 *	n.a. (not available)
Threshers	12,457	13,900 *	n.a.
Combines	2,525	33,531	42,663
Motor Trucks	7,319	58,749	123,835

Sources: Census and "A Historical Series of Agricultural Statistics for Alberta", 1969

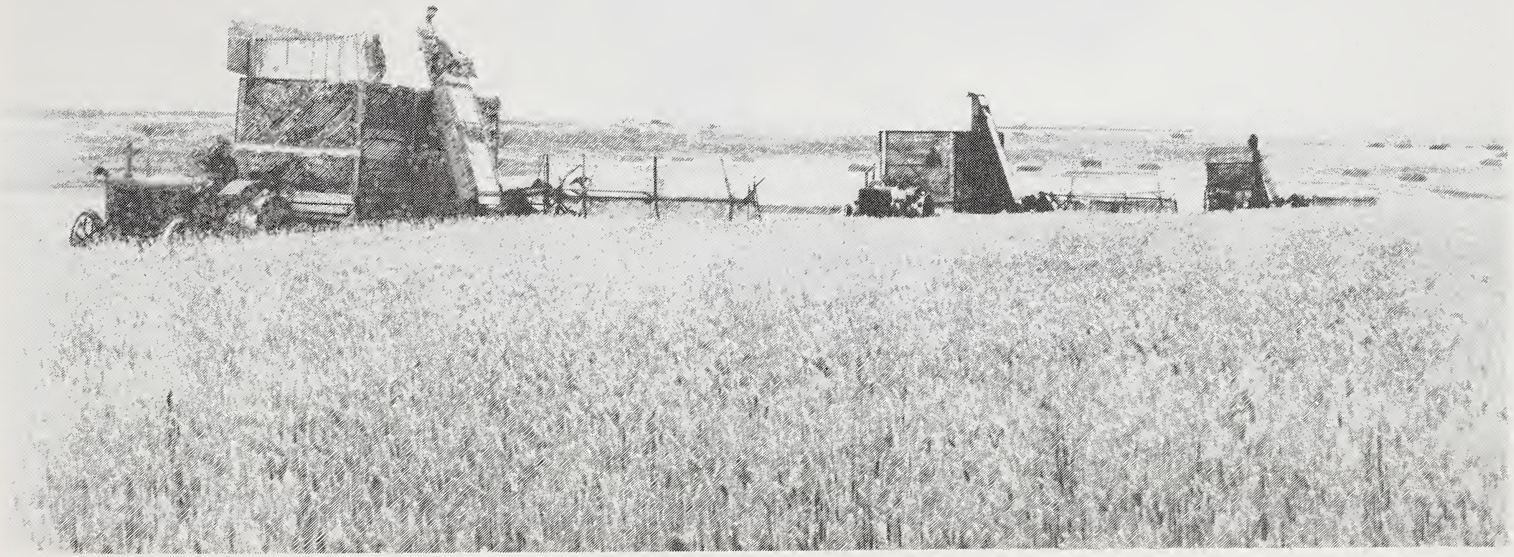
* 1956 data represents an average of 1951 and 1961 census figures.

NOTE: By 1956 a large number of binders and threshers were not in use, though still counted in farm equipment inventories.

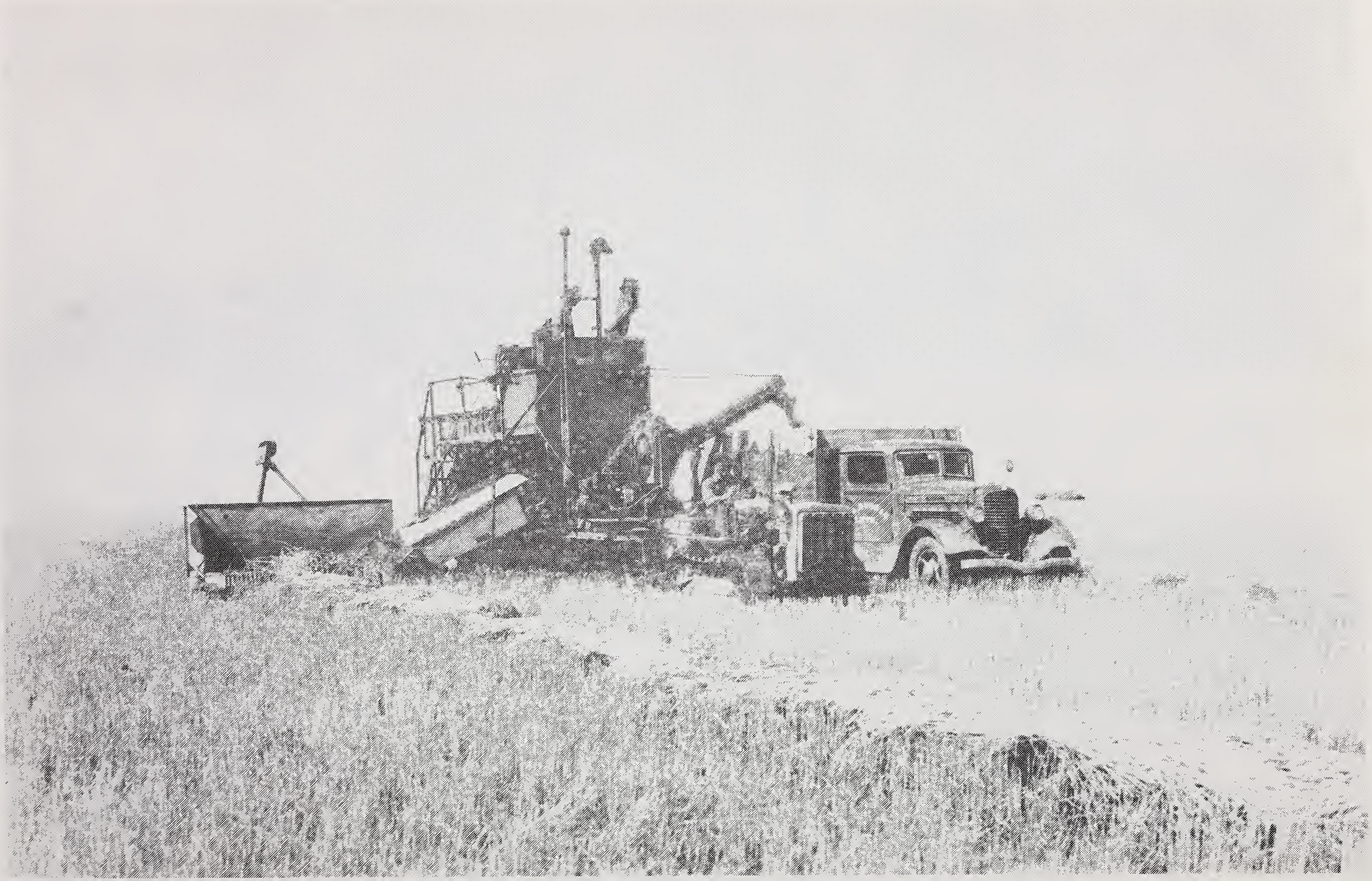


Inventions were always welcome if
they could help to reduce the
labor of farming.

Owen Gilbert's invention
Stookers 1930.

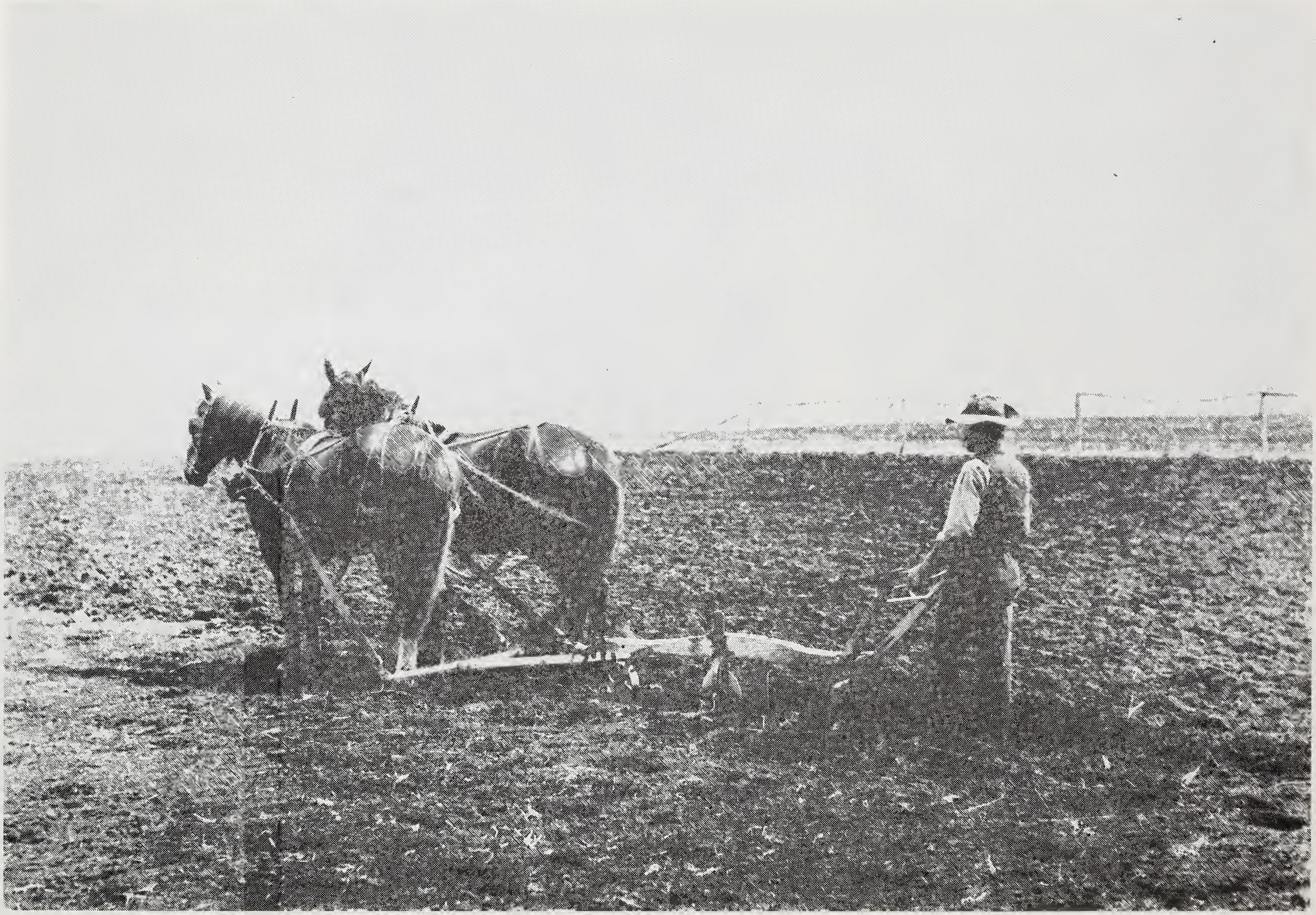


Provincial Archives of Alberta
H. Pollard collection, P738.



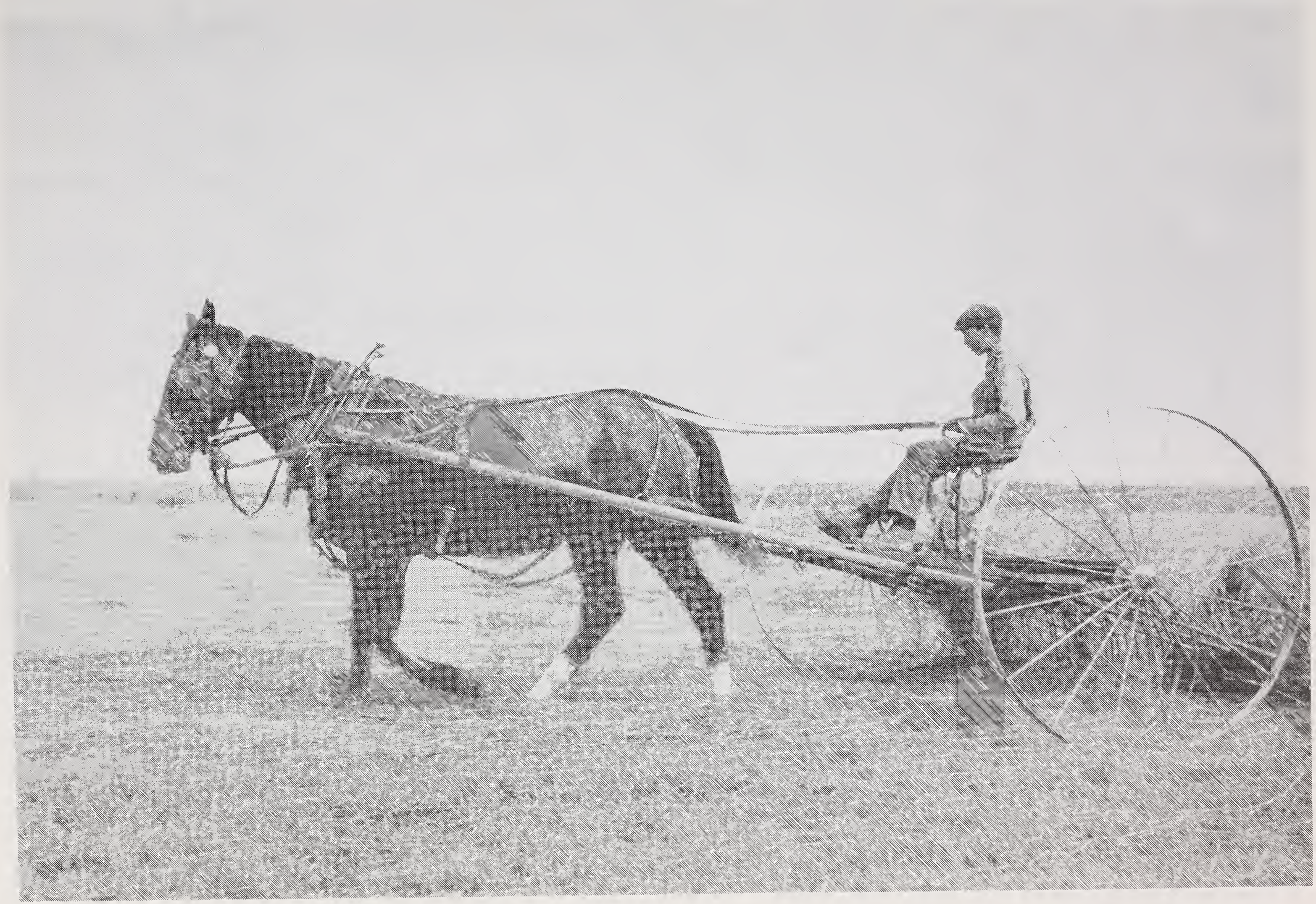
Combine Harvesting near Lethbridge 1948
Provincial Archives of Alberta
H. Pollard collection, P724.

Ploughing Scene near Calgary, 1884

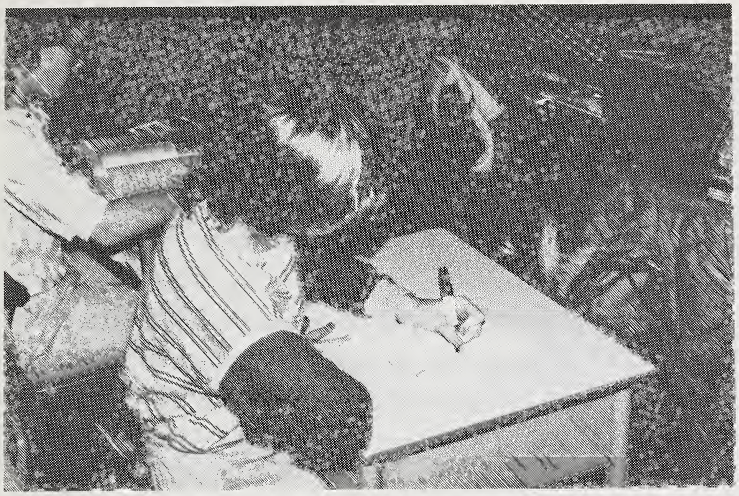


Provincial Archives of Alberta

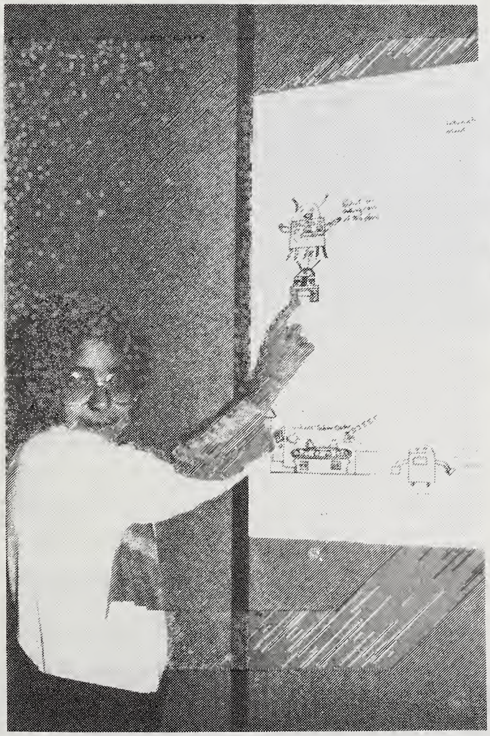
Hay Making was a Boy's Job

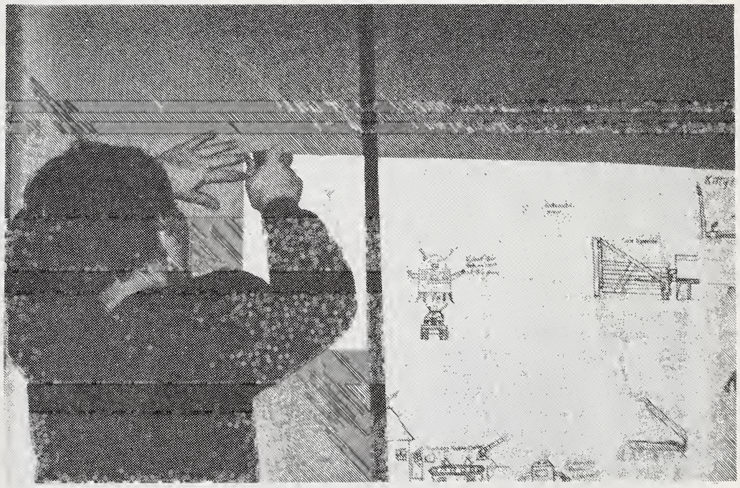


Horse drawn rake, 1915
Provincial Archives of Alberta
A 9615.



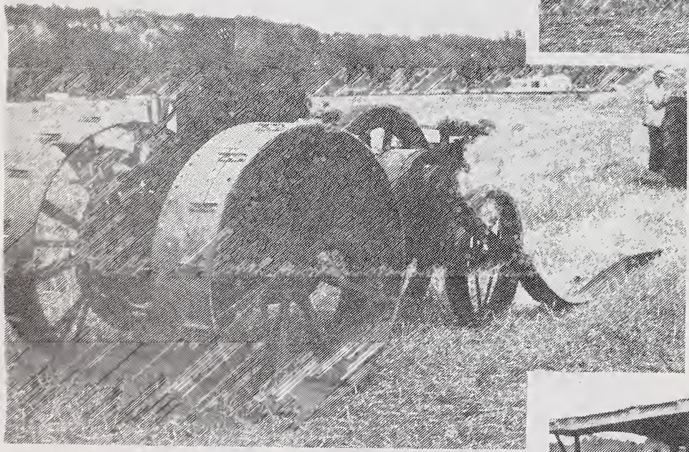
Students from Joe Clark School in High River create, display and market their inventions.





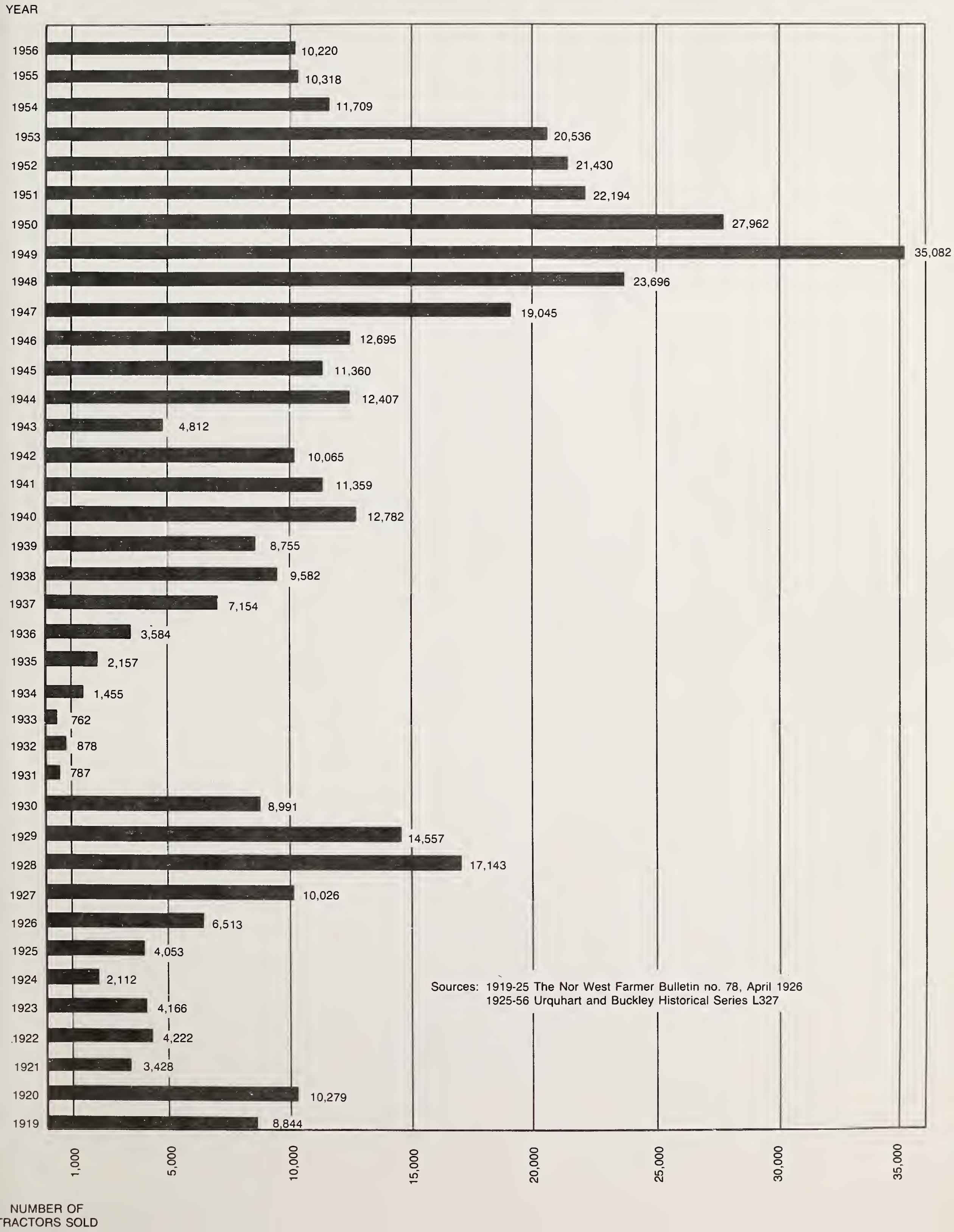
"Students were very keen about designing, sharing and selling their own machines."

The acceptance of tractor power was slow.



Scenes from Fort Edmonton Park kindly donated by Al Kosmak.

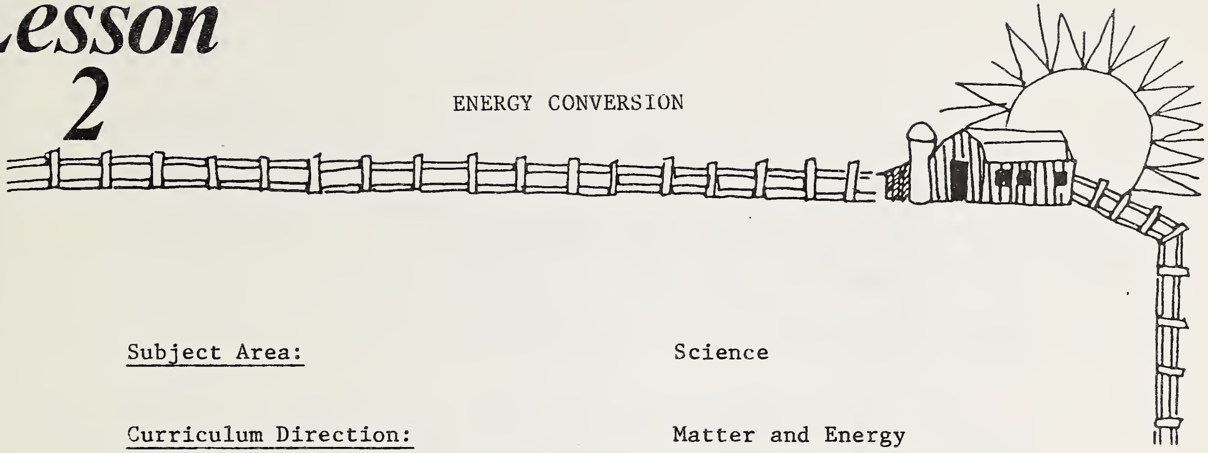
TRACTOR SALES IN THE PRAIRIE PROVINCES 1919-1956



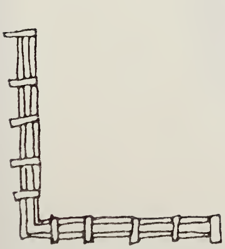
Sources: 1919-25 The Nor West Farmer Bulletin no. 78, April 1926
1925-56 Urquhart and Buckley Historical Series L327

Lesson 2

ENERGY CONVERSION



Subject Area:	Science
Curriculum Direction:	Matter and Energy Changes in matter Energy resources Conservation
Major Concepts:	Responsible use of energy Examples of energy forms and uses
Lesson Concepts:	Farming practices have a direct influence on the process of energy conversion. Many farm activities support the food chain.
Purpose:	To show how man manages energy cycles for his benefit. To understand how farming practices are related to the food chain.
Materials Required:	Copies of the fact sheets supplied with this lesson.
Time Required:	2 class periods



Introduction:

All living things depend on energy in one form or another. The primary source of energy on earth is the sun. The sun generates what is called solar energy. All other forms of energy originate with solar energy.

Gas, oil and coal are fossil fuels that had their beginning millions of years ago. They were once expansive forests that died, decayed and were finally compressed by millions of years of deposits. Not all conversion processes take millions of years. The simple food chain can be completed in a few hours.

The food chain is the result of solar energy being progressively changed from one form of energy to another to provide nutrition for plants and animals. Through photosynthesis, plants are able to use solar energy directly to manufacture food which is in turn suitable for some animals. Animals convert this high fibre energy into a high quality protein which is required by other animals and man.

Man's increasing need for both plant and animal energy sources has led him to take a hand in the food chain. Efforts to increase the efficiency of this natural cycle have resulted in one of the world's oldest and most essential industries. Agriculture.

The fact that all living things are interdependent makes it necessary for man to participate in the natural cycles which affect his life. In this exercise you will discover which farming activities are directly related to the production of energy.

PROCEDURE:

Part 1

Introduction:

Introduce the concept of energy - production and use. Ask the students to name as many different kinds of energy that they can think of. Focus the discussion on food energy.
How is solar energy changed into useable fuel for people?

Part 2

The Food Chain:

What is a food chain?

Give several examples

Is man a part of a food chain? Does man eat food? Then he must be a part of a food chain.

Man helps his food chain by farming. (Raising plants and animals for food.)

(a) Farmers help the food chain by helping plants and animals to grow and mature.

(b) Some plants provide food for animals.

(c) Some plants provide food for man.

(d) Some animals provide food for man.

There are many kinds of farmers in Alberta.

(a) Dairy farmers raise and milk cows to give us milk and milk products.

(b) Poultry farmers raise chickens and other birds for meat and eggs.

(c) Beef farmers raise cattle for meat production.

(d) Grain farmers grow grains for cereal, bread, vegetable oil, beer, and animal feed.

Part 3

The Activity:

a) Divide the students into four groups.
b) Give each group a copy of the Food Chain Work sheet.
c) Give each group one of the four farming operation fact sheets and ask them to decide which farming activities listed on their fact sheet support the links in the food chain.
d) Have students do the Farming and Food Chain worksheet.

Conclusion:

It is important to plan an effective conclusion to this lesson. Using the flow chart of the Farm operation, explain how the various activities affect energy production. The points where energy is actually converted to a new form are designated.

Ask the students what would be the consequences of omitting one or more of the steps. Students should be able to see that most of the steps influence the quantity and quality of the end product.

For Discussion:

1) Is there any way that we influence the food chain in our daily lives?
2) How is energy conversion managed by a farmer?
3) How does this compare to a natural energy cycle?

Related Activity:

1. Make a list of the by products which are the result of agricultural production of food.

2. Grow four edible plants; two in the classroom and two outside. Take special care of the classroom plants and leave the others to nature. Which grows the best? Why?

3. Visit a well organized farm - for a guided tour of typical farm activities.

Optional Resource Material:

The film " The Sun Changers " available from the Department of Agriculture.

EGG PRODUCTION

Some typical activities:

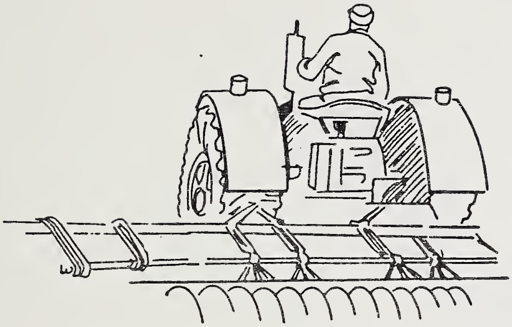
1. Feeding and Watering
2. Disease control
3. Feed preparation
4. Facility cleaning
5. Egg collection
6. Egg grading
7. Hatching
8. Selection of good quality birds
9. Spreading manure on cropland

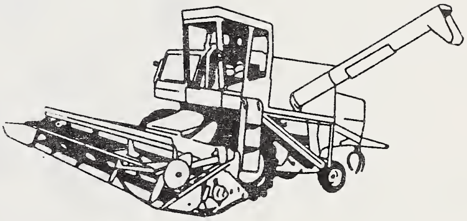
RANCHING

Some typical activities:

1. Fence building
2. Weed control
3. Watering
4. Health care
5. Selective breeding
6. Supervision during calving
7. Winter feeding
8. Herding stock from pasture to pasture
9. Growing feed for winter
10. Selling animals to market

GRAIN PRODUCTION

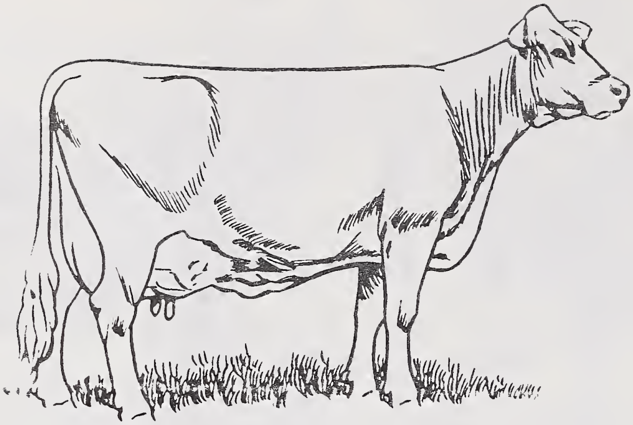




Some typical activities:

1. Seed selection and cleaning
2. Cultivation of the land
3. Seeding the crop
4. Pest control
5. Weed control
6. Disease control
7. Harvesting
8. Machinery repair
9. Irrigation
10. Fertilizing the land

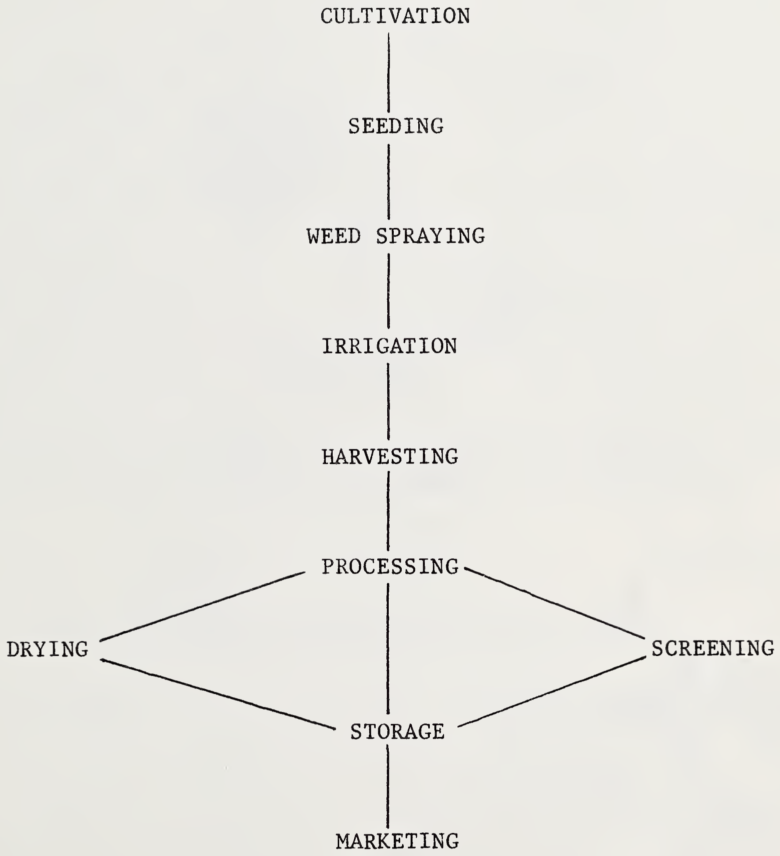
DAIRY OPERATION



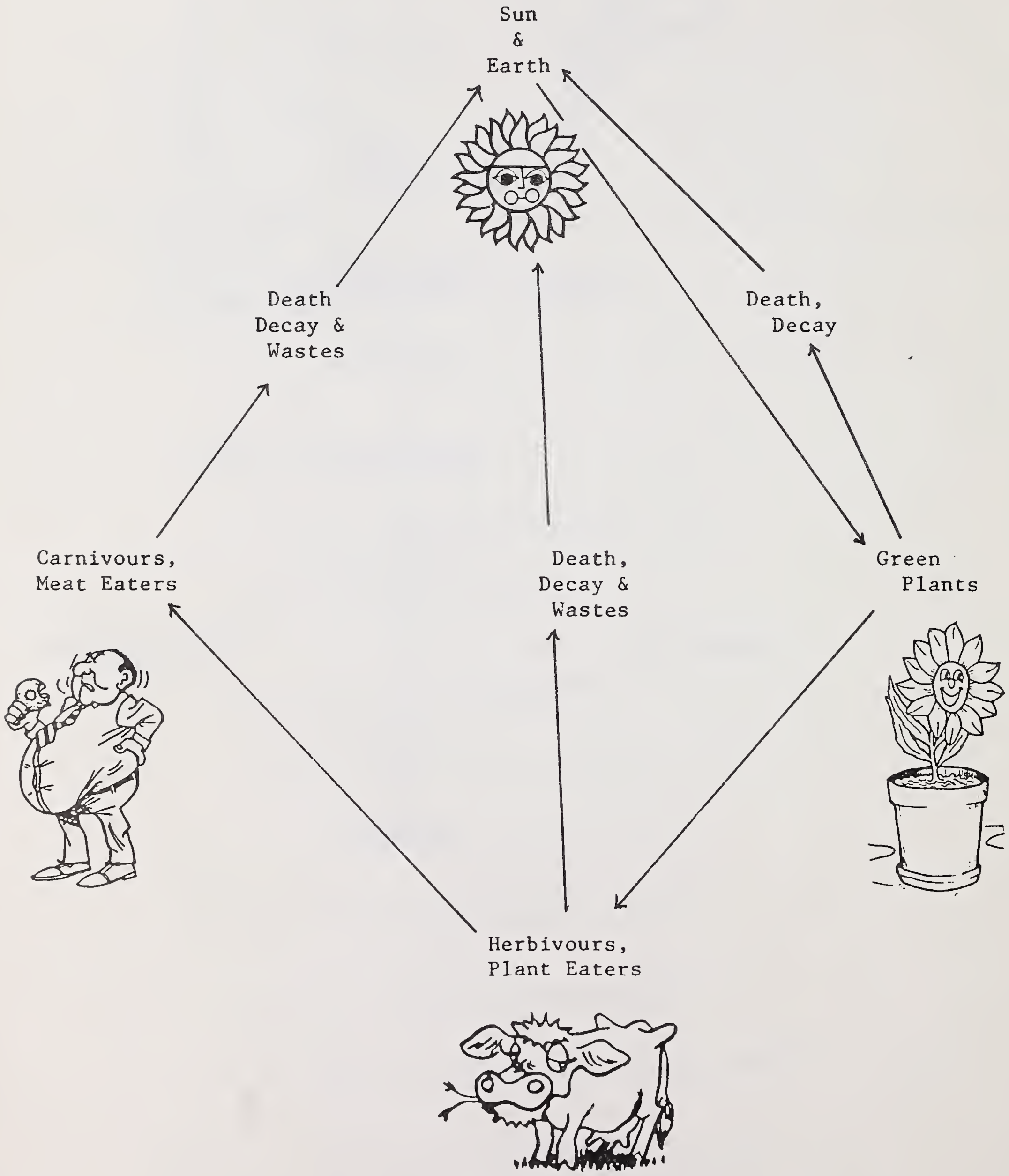
Some typical activities:

1. Feeding and watering
2. Health care
3. Selective breeding
4. Supervision of calving
5. Milking
6. Cleaning barns and yards
7. Cleaning milking equipment
8. Care and raising of young animals
9. Growing hay and grain for feed
10. Spreading manure on crop land

FROM SEED TO FEED



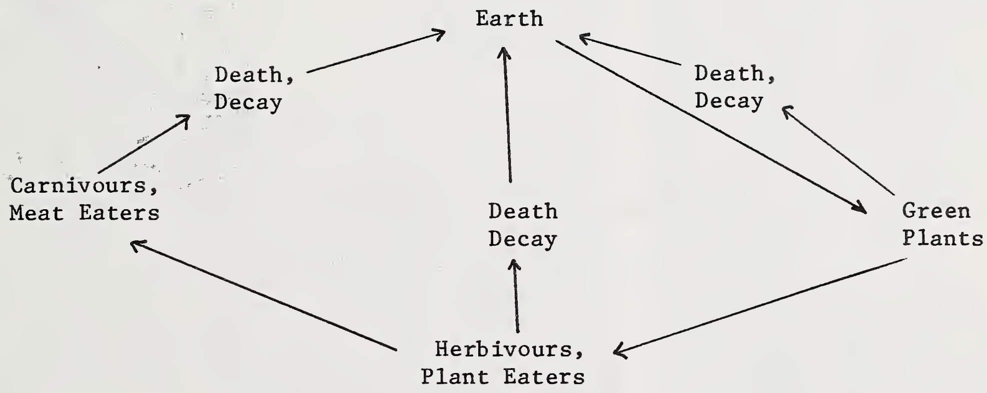
FOOD CHAIN


Sun
&
Earth
Death
Decay &
Wastes
Death,
Decay
Carnivours,
Meat Eaters
Death,
Decay &
Wastes
Green
Plants
Herbivours,
Plant Eaters

Fact Sheet

FARMING AND THE FOOD CHAIN

Simple Food Chain



This information will help you to complete your work sheet. Read carefully and then start to fill in the blanks on your work sheet.

Understanding How Farmers Help The Food Chain

Food Chain Link	Activity Example
1. Earth	- irrigation - cultivation - fertilization
2. Green Plants	- seeding - growing crops - harvesting - weed and pest control
3. Herbivours Plant Eating Animals	- feeding & watering - hatching - disease control - animal care - breeding
4. Carnivours Meat Eaters	- milking - collecting eggs - marketing animals

Worksheet

FARMING AND THE FOOD CHAIN

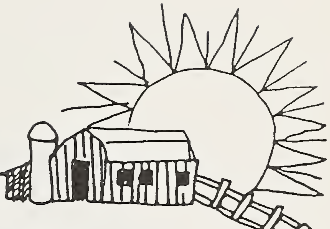
Type of Farm operation ______________________________

Food Chain Link	Farm Activities
Earth	______________________ ______________________ ______________________ ______________________ ______________________
Green Plants	______________________ ______________________ ______________________ ______________________ ______________________
Herbivours (Plant Eaters)	______________________ ______________________ ______________________ ______________________ ______________________
Carnivours (Meat Eaters)	______________________ ______________________ ______________________ ______________________

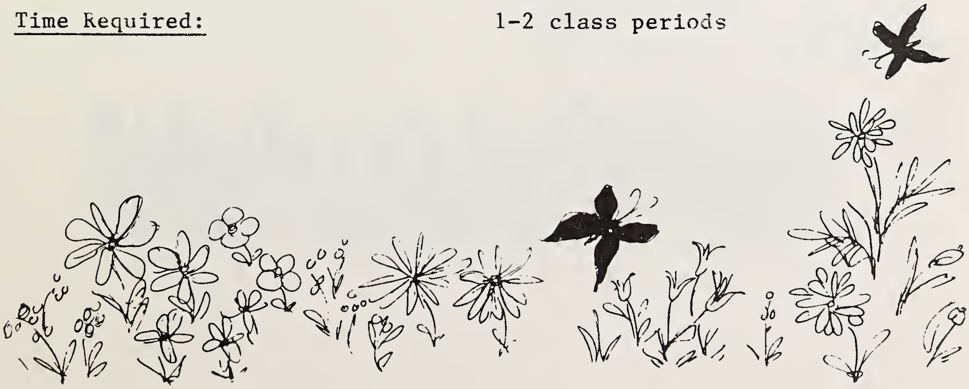
From Seed to Feed.

Lesson 3

CULTIVATION VS. GRAZING



Subject Area:	Social Studies
Curriculum Direction:	Alberta Past, Present and Future The effect of climate and geography on agricultural land use.
Major Concepts:	Our Natural Resources Conservation Human needs Consumption Natural resources
Lesson Concepts:	Responsible management of Alberta's agricultural resources is essential in order to maintain the productivity of one of our greatest resources - the land. Grazing is a logical alternative to cultivation on poor quality or fragile land.
Purpose:	To introduce students to the concepts of conservation of natural resources while meeting human needs. To give students an opportunity to explore issues of land use related to Alberta's food industry.
Materials Required:	The worksheets provided in this lesson. Further Information - "History of Legislation"
Time Required:	1-2 class periods



Introduction

When the pioneers came to Alberta good land seemed to be unlimited. Prairies, parklands and boreal forests formed endless expanses of vegetation. Settlers soon discovered the best cropping regions and began to till the land, growing grains and food for themselves, their livestock and some for export.

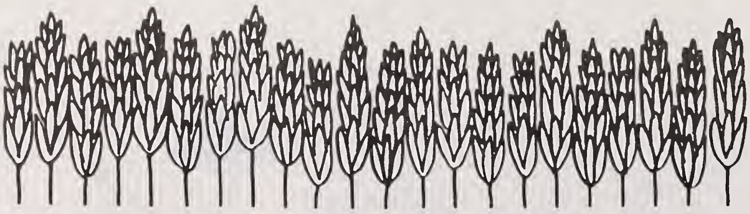
Not all settlers were fortunate enough to select choice soils. Some agricultural production limitations were visible from a quick look at the property, while others remained to be discovered. Farmers who were looking for good crop land looked at things such as terrain, soil types, weather patterns. This may have had to be a rather hasty decision based on very sketchy information a hundred years ago. Today, most of Alberta has been surveyed and the soil types and their related agricultural capabilities have been determined.

It is the modern farmer's responsibility to gather as much of the available data together and make a decision as to what is the best possible land use for a particular piece of property.

This is not a new idea. As long as man has been cultivating the soil good land use has been a concern. The amount of good, arable land is limited. Our farming practices must be efficient and conservationally sound, so that we maximize production while maintaining or improving the capabilities of the land.

In this lesson we will take a look at two major agricultural land uses. What determines the farmer's choice as to practices and one alternate choice of utilization of some of our less productive land.

The two major land use choices to be considered in this exercise are grain cropping or pasture. This may not appear to be a very serious issue on the surface. However, you will find many things influence the final decision as to the best land use for any area.



Part 1

Introduction:

- Discuss Land Use - What is it?
- In this lesson we will look at two ways that land can be used for food production.

  1. Cultivation
  2. Grazing or Pasture

Part 2

Evaluating:

Alberta has a variety of land types. Review the guide lines for land use.

Pass out the work sheet "How Would You Use This Land?" and see if the students can select the best land use for the three farms.

Part 3

Researching:

1. Alberta can be generally classified into eco-regions. These large areas are constant in many ways; such as soil, terrain, weather conditions. For example, the Grasslands are flat to rolling, have brown soil and have limited rainfall. These conditions favour grass as a native vegetation.

2. Review the eco-region map and the general characteristics of each of the regions. (Information supplied in this lesson.)

3. Have the students find their location on the eco-region map. What region are they in?

4. Ask students to complete the worksheet "Getting To Know My Region".

Conclusion:

We all recognize that it is important for our agricultural land to be as productive as possible. The demand for food is ever increasing. The supply of farm land is ever decreasing.

Misuse of the land may result in some serious problems. Non use of useable land can result in a shortage of food.

We have looked at the best use for the land types given on the work sheet. Now lets consider what might be the consequences of misuse. First, what are some of the other agricultural uses for lands described in this exercise?

What might be the consequences of these practices?

For Discussion:

1. What about the expansion of urbanization into prime farm land?
2. Should this be subject to control?
3. Are there any regulations regarding this issue in Alberta?
4. What eco-region do you live in?
5. a) What do some of the farms in your area produce?
   b) What are some of the topographical features of your area?
   c) How are the agricultural products related to the land features?
6. How does the land change as you move out of your area?

   North West South East

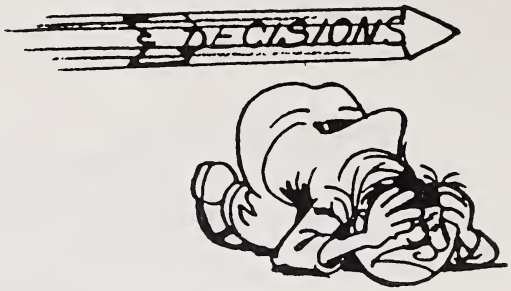
Related Activities:

1. Do a survey of Agricultural land use in your area. What percentage of the land is used as pasture?
2. Stage a debate.
   The Ranchers vs. The Farmers
   (Grazing) (Cultivation)

Optional Resource Material:

1. The film, "The Sun Changers" available from the Department of Agriculture.
2. Further Information - "History Of Legislation Affected The Land Use In Alberta".

Worksheet



HOW WOULD YOU USE THIS LAND?

A

Topography	Gently rolling.
Soil Type	Brown, some alkali.
Native Vegetation . .	Short grass.
Weather Conditions .	Very little precipitation, chinooks in winter strong winds.

Circle what you think would be the BEST land use.

Cultivation Grazing

B

Topography	Quite flat.
Soil Type	Rich, black.
Native vegetation . .	Fescue grass and some aspen trees.
Weather conditions . .	Moderate rainfall, Light winds, Fairly long frost free season.

Circle what you think would be the BEST land use.

Cultivation Grazing

C

Topography.	Hilly terrain with sloughs in the low areas. Many stones on the surface.
Soil Type	Grey wooded.
Native vegetation . . .	Wooded - aspens and spruce, some meadows. Water plants in the wet areas.
Weather conditions . . .	Heavy rainfall, Moderate winds, Meduim length frost free season.

Circle what you think would be the BEST land use.

Cultivation Grazing

Worksheet

GETTING TO KNOW YOUR REGION

1. What eco-region do you live in?

2. Write the general description that is given for your area.

   Climate

   Topography or terrain

   Natural vegetation

3. Look on the soil map to see what kind of soil is common in your area. Write the characteristics of the soil.

4. How is the land used around your community?

5. Is the land around your area best for grazing or cultivation?

   Why?

Fact Sheet

Factors Related to Agricultural Land Use

Some of the factors which determine whether land is more suitable for cultivated crops or grazing.

Factors to consider:

1. Potential yields of cultivated crops - returns or profits
2. Cost of production.
    - Soil fertility
    - Rainfall
    - Irrigation potential
    - Rocks
    - Topography
3. Land conservation - the value of forage crops or native vegetation grazing.

Factors Favouring Cultivation	Factors Discouraging Cultivation
1 - level terrain	1 - hilly uneven terrain
2 - good surface and parent soil material	2 - poor soil, alkali soils or stony parent soil material.
3 - favourable weather conditions	3 - short growing season or too wet or dry conditions
4 - extensive areas of land suitable to cultivation	4 - small choppy parcels of good land
* A farmer would probably choose to use land with these characteristics for cultivation.	* A farmer would probably choose to use land with these characteristics for grazing.

Alberta can be generally classified as to ecoregions. These are large areas which have relatively constant conditions such as soil, terrain and weather patterns. The various combinations of these factors favour certain types of vegetation. Most agriculture is dependent on the vegetation which can be produced on any plot of land. Within the ecoregions and even within the space of one mile in any direction land features can change significantly enough to favour a whole range of vegetation not typical of the larger land mass.

For example, a flat plain - suitable for crop farming may be intersected by a coulee or creek bed. Thus the crop land may give way to a region of land which can not be tilled. Most farmers would utilize this area as pastureland if sufficiently large and if water is available for stock.

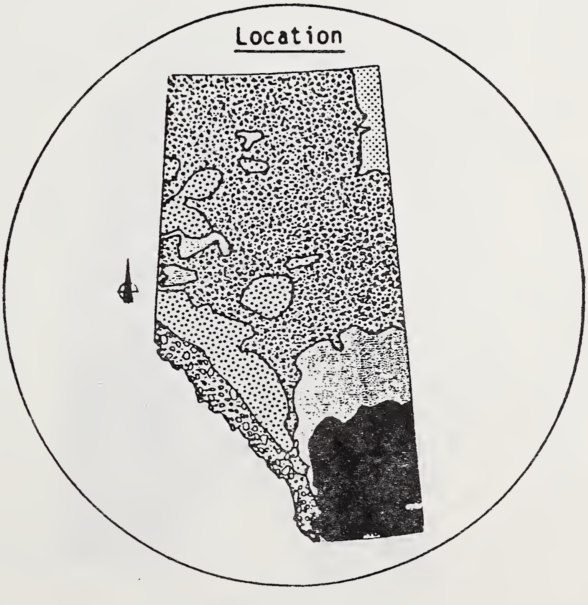
ECOREGIONS OF ALBERTA

GRASSLAND

Climate	Warmest and driest in the province Cold winter. Warm summers. Chinooks. High wind velocity.
Topography	Gently to strongly rolling plains. Some level glacial lake beds.
Natural Vegetation	Short and mixed grasslands.

Special features related to Agriculture

Streambed coulees, badlands.

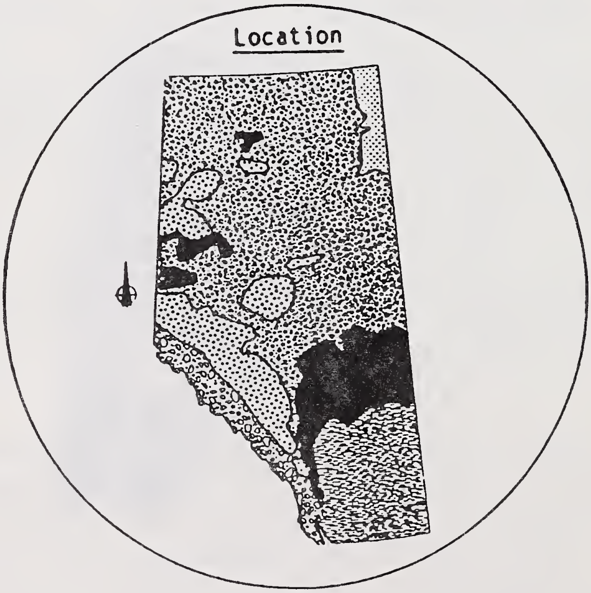


* Black areas
indicate regional location.

ECOREGIONS OF ALBERTA

PARKLAND

Climate	Moderate precipitation, temperature and winds. Peace river region - high precipitation, short summers. Foothills region - strong winds and chinooks.
Topography	Variable: level glacial lake beds. rolling areas. Hummocky moraine.
Natural Vegetation	Fescue grass and aspen bluffs. Wetlands-marsh and meadow vegetation. Some alkali ponds restricted to salt tolerant species.
Special features related to agriculture	Sand dunes and plains. Badlands.

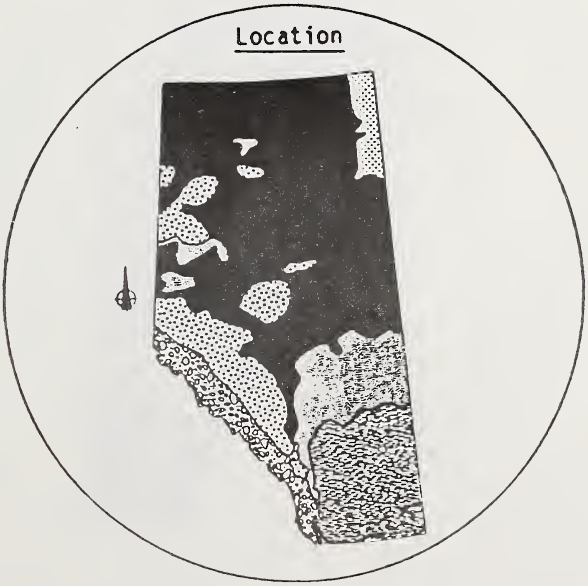


*Black areas
indicate regional location.

ECOREGIONS OF ALBERTA

BOREAL FOREST

Climate	Variable - short summer, high precipitation Cold winter.
Topography	Broad low plains. Discontinuous hills. Land is generally low and poorly drained.
Natural Vegetation	Mostly forested, Poplar, Spruce - Sandy areas. Jack Pine - Extensive wetlands contain bogs of peat moss.

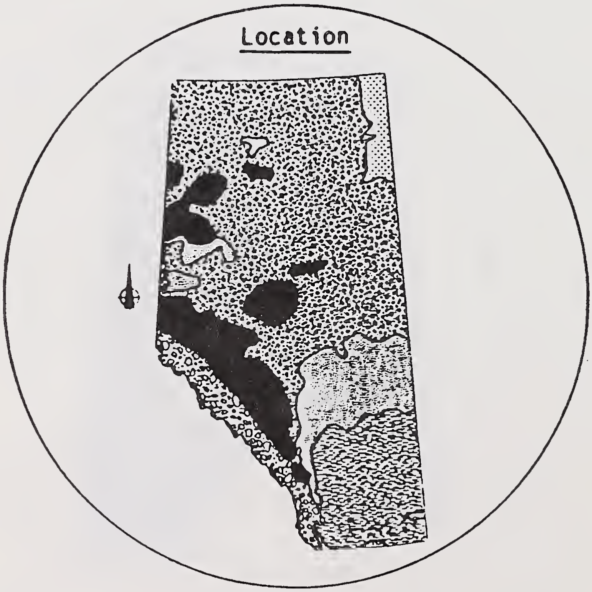


*Black areas
indicate regional location.

ECOREGIONS OF ALBERTA

FOOTHILLS

Climate	Variable - high precipitation, summers cool, Winters moderate.
Topography	Folded bedrock. Long wide valleys, steep inclines.
Natural Vegetation	Forested with mixed woods - extensive stands of lodgepole pine with a limited understory vegetation. Black spruce in wet areas.

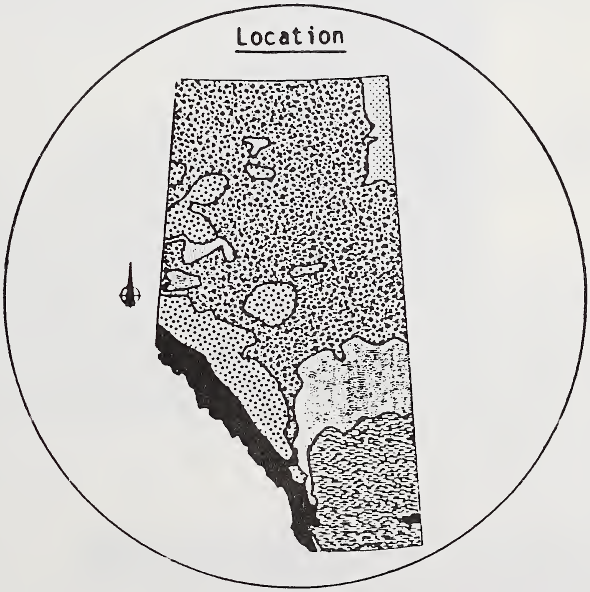


* Black areas
indicate regional location.

ECOREGIONS OF ALBERTA

MOUNTAIN

Climate	High wind velocity at higher altitudes. High precipitation. Some chinook action.
Topography	Rugged upthrust bedrock. High elevations, deep gorges. Wide valleys.
Natural Vegetation	Montane areas - grasslands, Douglas Fir, Limber Pine. Subalpine - Forests of fir and spruce stunted at higher levels. Alpine - Above the tree line, lush herb meadows.



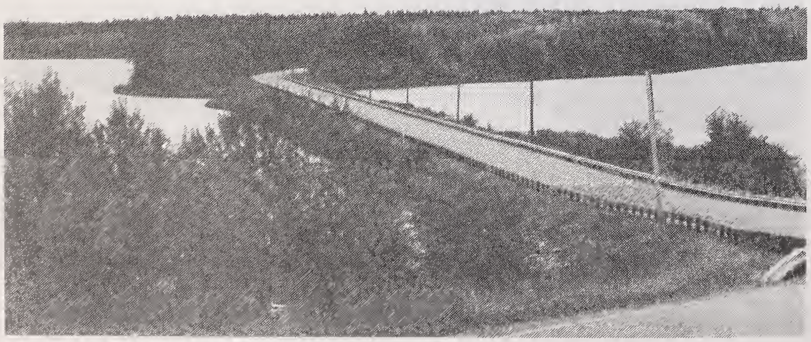
* Black areas
indicate regional location

Grasslands

- located in southern Alberta. The landscape is nearly treeless. The dry climate may limit agricultural production in this region, where irrigation is not feasible.

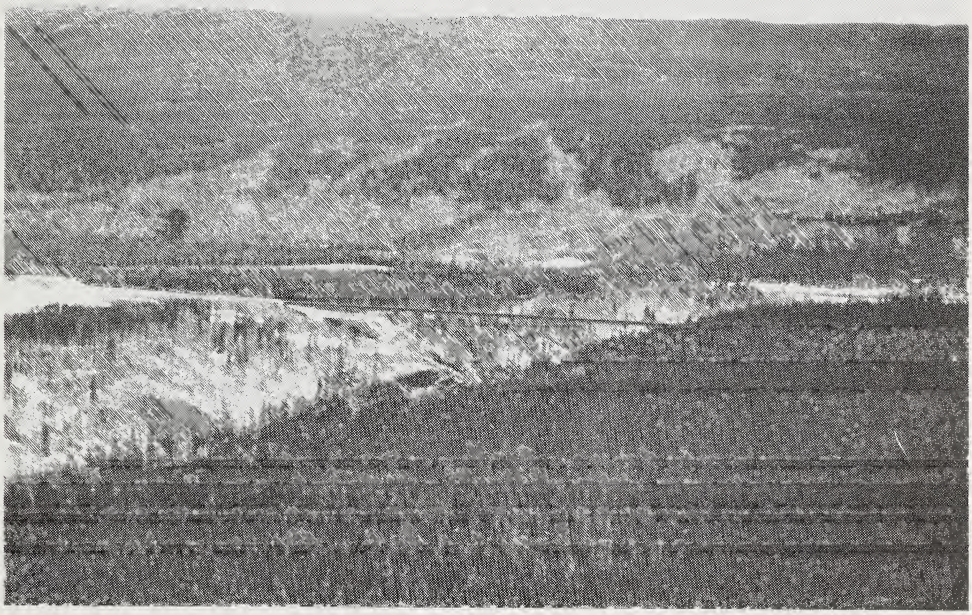
Parkland

- located in central Alberta and in some northern regions has a mixed tree and grass cover. This is some of Alberta's most productive agricultural land.



Boreal Forest

- located in northern Alberta. This region is characterized by a nearly continuous tree cover and has limited agricultural value.



Foothills

The foothills of north western Alberta are steep and mostly tree covered. They provide much of the timber for our lumber industry. In southern Alberta the grass covered foothills are used for cattle rangeland.

Mountains

Located on Alberta's south western border, these beautiful ranges have little agricultural value.

The flat land is used for crop, the hilly land is used for pasture. Notice the old fashioned stooks in the field. You would not see many fields like this today.

Cattle graze on the stony rangeland of Alberta's southern foothills.

A. SOIL GROUP OR ZONES

Soils can be identified and classified in a similar manner to plants and animals. In addition to identifying and describing the various types of soil, it is very useful to map these soils as to their geographic location. A very broad grouping of soils is shown in the Soil Zone or Group map of Alberta enclosed with this lesson. On this map, soils are grouped on the basis of color of topsoil, which is primarily a reflection of the vegetation and climate prevalent during soil formation.

1. Brown Soil Zone

Brown soils occur in the semi-arid region of southeastern Alberta. Annual precipitation averages about 300 mm (12 in.) and native vegetation is short-grass prairie. Lack of moisture has resulted in the development of soils with relatively thin profiles and lower levels of organic matter than the Dark Brown and Black soils to the north and west. Lack of rainfall is the main limitation to crop production in this area.

2. Dark Brown Soil Zone

Dark Brown soils are similar to the Brown soils but have a greater accumulation of organic matter. The A-horizon is darker coloured and usually thicker than in the Brown soil. Average precipitation is about 350 mm (14 in.). The boundary between the Dark Brown and the Brown soil zone is not sharply defined.

3. Black Soil Zone

The Black soils have formed under grass and parkland. Annual precipitation averages between 375 and 500 mm (15 - 20 in.). The loss of moisture by evaporation from the soil in the Black soil zone is generally less than that from soils in the Brown and Dark Brown soil zones. As you go deeper, the blackish colored topsoil shades through the browns to a lighter colored parent material. The moisture supply is adequate for abundant vegetation but has not caused excessive leaching. Because of the high organic matter content and higher precipitation in this zone, the productivity of Black soil is quite high.

4. Dark Gray and Dark Gray Wooded Soil Zone

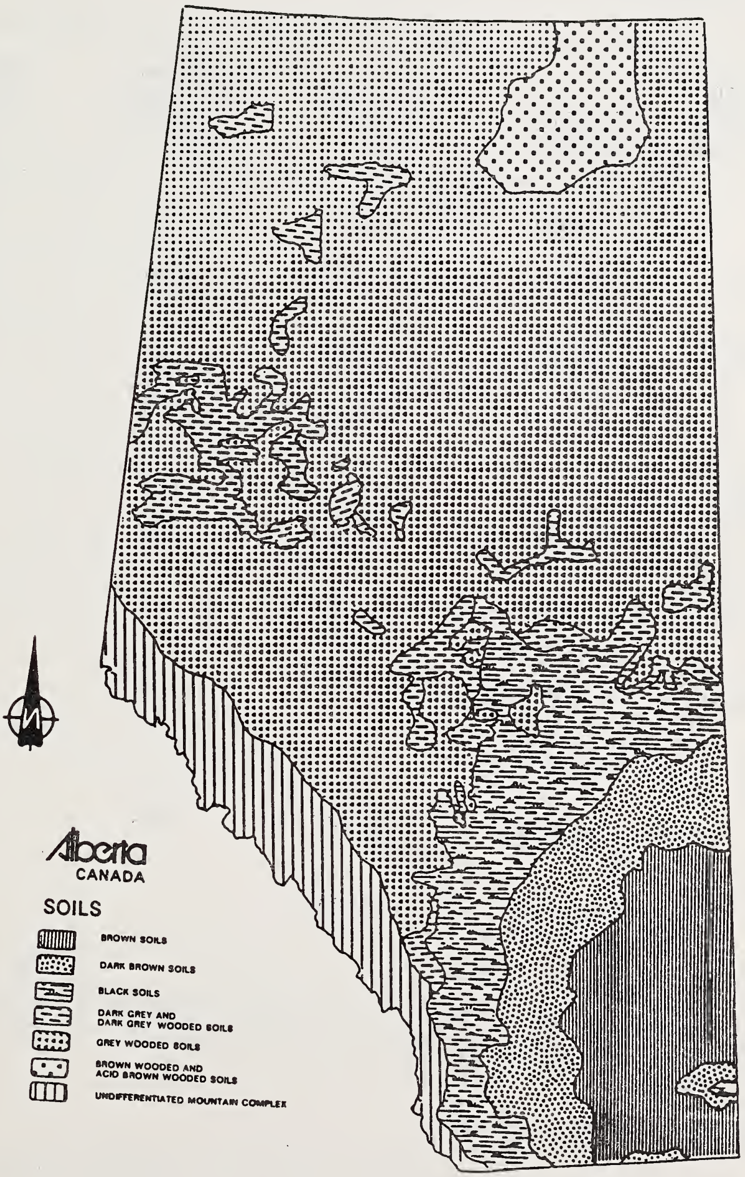
Dark Gray and Dark Gray Wooded soils occur generally to the west and north of the Black soil zone. This soil zone represents a transition in climate, vegetation, and resultant soil color from the Black to the Gray Wooded soil zone. During development, these soils have been influenced alternately by grass and tree vegetation. Therefore, soil development has been affected by both calcification and acid leaching soil forming processes. The area is now primarily mixed woodlands, with the evergreens more common in the colder (higher) sections.

5. Gray Wooded Soil Zone

The soil profile in the Gray Wooded (Luvisolic) zone can be variable. Except in burnt over areas, a thin layer of partially decomposed acid organic material lies above a deeply leached surface soils ranging in color from grey-brown to dark grey. This layer in turn, breaks into a more compact finely textured sub-soil, often darker in color. Acid leaching has been the dominant soil forming process. Soil microorganisms in this soil zone tend to break down plant residues into water soluble forms. So although organic matter is often plentiful at the surface, many of the products of its decomposition are leached downward out of the surface soil. Consequently, the natural fertility of the Gray wooded soils is relatively low.

Although the soil Group map provides an overview of soil-climatic areas of the province, it is of little use in a detailed assessment of soil and land resources on a regional, county, or individual parcel basis. In Canada, land resource information has been developed using the Canadian System of Soil Classification. Soil surveys have been conducted, and reports and maps published. Canada Land Inventory (CLI) soil rating maps have been developed from the survey information. These maps and reports are discussed later in this lesson.

Farm Home Study Course.
Alberta Agriculture


Alberta
CANADA
SOILS
BROWN SOILS
DARK BROWN SOILS
BLACK SOILS
DARK GREY AND DARK GREY WOODED SOILS
GREY WOODED SOILS
BROWN WOODED AND ACID BROWN WOODED SOILS
UNDIFFERENTIATED MOUNTAIN COMPLEX

ACREAGES OF CLI SOILS SUBCLASSES IN ALBERTA[1]

CLASS	LIMITATION TO RANGE OF CEREAL CROPS	THOUSAND HECTARES	THOUSAND ACRES[2]	PERCENT OF TOTAL SURVEYED	PERCENT OF TOTAL AREA OF PROVINCE[3]
1	None	775	2 000	2%	1%
2	Moderate	4 000	10 000	9%	6%
3	Moderately Severe	6 000	15 000	14%	10%
4	Severe	10 000	24 000	22%	15%
5	Improved Pasture	12 000	29 000	26%	
6	Nonimprovable	3 000	7 000	7%	
7	Nonagricultural	5 000	12 000	11%	
Organic	(More than 12" Peat)	4 000	10 000	9%	
TOTAL AREA CLI SURVEYED		44 000	109 000	100%	
TOTAL LAND AREA OF ALBERTA		64 000	159 000		

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[1] Taken from an estimate of the acreages of the soil capability for agriculture classes in Alberta. Soils Branch, Plant Industry Division, Alberta Agriculture, 1974 (Figures rounded).

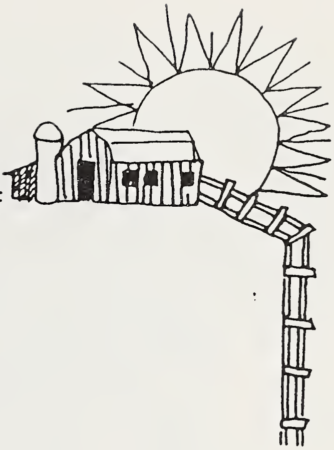
[2] Based on predominant soil class.

[3] In the area unsurveyed there is estimated to be very little if any No. 1, 2, 3 or 4 soil.

Source: Alberta Land Use Forum, 1974.

Lesson 4

LOOKING THROUGH DIFFERENT EYES



Subject Area: Language Arts

Major Concepts:
(Social Studies)
Regions
Industry
Resource Development
Employment
Meeting Human Needs
Technology
Productivity
Trade

Lesson Concept: What can be learned by using our observation skills? The importance of accurately communicating our observations to others. The limitation of observation without further information.

Purpose: To encourage students to use their imaginations by entering the fantasy world of outer space. To practice descriptive writing skills. To practice formulating theories. To enjoy a creative look at one of Alberta's major industries. To assist understanding of various lifestyles and agricultural enterprises in Alberta.

Time Required: 1 - 2 class periods.

Activity: Write a descriptive report.

Introduction

A drive through the country in Alberta usually has us admiring or commenting on the sights we see from the car window. Frequently what we find ourselves observing are farms of various descriptions. These are a part of one of Alberta's oldest and largest industries - Agriculture. Cultivating the land, harvesting a variety of crops and managing livestock, are operations whether large or small which contribute to the big-business of feeding the nation. Surplus produce and by-products find their markets in Canada and around the world.

Often, it seems we take this big business for granted. We hardly notice what's really going on in Rural Alberta as we travel from place to place. If we took a closer look, we would probably make some interesting discoveries. While all agriculture is dependent on such things as soil productivity and weather, there is a tremendous amount of variety to be found on Alberta's farms. Take size for example. In one instance a livelihood can be made on only a few acres in an intensified operation such as mushroom production or raising broiler chickens. This can easily be compared to the huge cattle ranges and crop farms of southern Alberta where thousands of acres may be a part of one operation. There is also a tremendous variety in the products, the machinery, and the farming activities.

PROCEDURE:

The Task

In this exercise the students will put themselves in a little different observing position. They are to imagine that they are residents of a different planet and have been sent on a fact finding mission to earth. They are to observe the activities of earthlings in rural areas of Alberta. The aliens are to collect as much information as possible and write up a description of their findings for the information bank on the mother ship.

The class may work on this exercise individually or in groups. If you choose groups, you may want to assign a different region of Alberta to each group.

The report should be approximately one page in length and should include such observations as: evidence of buildings, machinery, animals and human activity. Include speculations as to what is really going on. Remember this is an alien report so the reporters are relying on observation and speculation, not experience.

Conclusion

Have the students do a good copy of their report. They may wish to prepare some illustrations to support the written accounts. If time allows, the reports may be presented to the class.

For Discussion

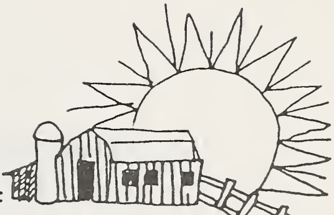
1. What were some of the most common observations made?
2. Is the Agriculture Industry restricted to rural Alberta?
3. In what ways can we observe Agriculture in the towns and cities?
4. How do the rural and urban Agriculture enterprises cooperate with each other?

Related Activities

1. Make a collage of pictures that show scenes of Agricultural Activities that the aliens may have seen on their mission.
2. Write a brief description of some of the things that may be seen in rural Alberta in the year 2085.
3. Write a short poem about your favorite farm animal.
4. Make a class list of words that are commonly used in reference to Agriculture. These may appear in the essays that the class wrote.

- EYE IN THE SKY -
Views of Alberta

Lesson 5



Planning to Move to The Homestead

Subject Area:

Social Studies
Grades 4 and 6

Curriculum Direction:

- Alberta Past, Present and Future.
- How people in earlier times met their needs.
- Major factors that influenced settlement.
- Transportation.
- Natural resources.

Major Concepts:

Development, growth, change, resourcefulness life style.

Lesson Concept:

The development of Alberta was the combination of human desire for change, political readiness and demand. Settlers provided the human resources to implement the Government of Canada's plans for development of the west.

Purpose:

- To improve planning skills.
- To experience some aspects of the early Alberta settlement.
- To develop decision making skills
- To share experiences and feelings of the settlers who chose to move onto the homesteads in Alberta.

Materials Required:

- Work sheets contained in this lesson
- Art supplies, clay, sticks
- Miscellaneous supplies which may be collected as required. (Example, moss).
- Further Information - "Settlement"

Time Required:

1 - 4 class periods.

To The Teacher:

This activity is closely related to #6 and #7. You may choose to do one or all three of these activities. The major concepts are found in the Social Studies curriculum. The emphasis is on Language Arts skills. Supplementary activities include Role Playing, Art and Physical Education Skills. I feel your students will enjoy experiencing pioneer life in early Alberta through some of the exercises suggested in these lessons.

The resource material in Lesson 6 will assist with this lesson.

PROCEDURE:

Part 1

Introduction:

Discussion:

1. How would you feel if your family decided to move to another country?
2. How would you feel if your whole family was allowed to take only as many things as they could fit into a small van?

Part 2

Background:

In this exercise you are going to imagine that this is happening! Do you know that this actually happened to thousands of families who moved to Alberta between 70 and 100 years ago?

Moving from one home to another, changing jobs and starting fresh are huge decisions. Most of us have made one of these decisions once or twice or have known someone who has. Moving from out of the country to the wilderness of Alberta 70 to 100 years ago was a great decision. Inspite of the many hardships, thousands made that very decision. Some were seeking adventure, but most were looking to improve some aspect of their lives. One way to begin to understand some of the thoughts and feelings of these brave people is to imagine ourselves in their places, at the turn of the century.

This activity will be successful if our imaginations can take us back in time so that we can actually be one of the many pioneer families who settled in Alberta. Planning the move, selecting the fertile sometimes harsh land, and setting out to fulfil the requirements of the homesteading act, will help us to re-live a segment of Alberta's human history.

There was a great diversity in the early pioneers. They brought with them many skills and interests. In this lesson, we will focus on the pioneers who came to settle on the homesteads and farm the land.

Part 3

Making Plans:

1. Divide the class into small family groups of 4 - 6 members.

2. Have each group choose the family members of the group. These may include Grandparents, parents, children, aunts, and uncles.

3. Each family group will be asked to pretend that the Father and Mother have decided to move to Alberta.

4. Groups may choose to dress up for their parts.

5. Review the essay on Settlement in Alberta and the Pioneer possession list supplied in this lesson.

Part 4

Sharing with others:

6. Students will be asked to do a short skit of their family making plans and packing for their journey to Alberta.

7. At the beginning of each skit, have one member of the group introduce his/her family. Share with the class the following information about your family.

   a. Each family members' name, relationship, age.
   b. What country is the family coming from?
   c. What year (date) are they moving to Canada?
   d. Why are they moving to Canada?
   e. How did the family make a living in their homeland?

8. Do a short 2 - 5 minute skit of making arrangements to move - moving the dog, planning to move.

Conclusion:

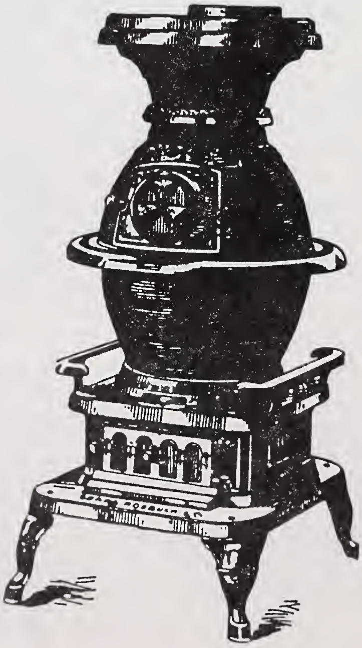
1. Have the groups prepare a list of the things they will take with them. (Put the name of the group on the top of the list.) These may be displayed on the poster board for a few days.
2. Students might want to use the Worksheet "Packing List" and "The Personal Packing List" to assist them with this project.
3. These lists may contain pictures of some of the items.

For Discussion:

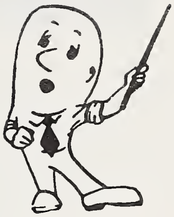
1. Compare the families.
2. What would the community be like if they became neighbours in Alberta?

Related Activity:

1. Make travel plans using the worksheet "The Planner".



Worksheet



THE PLANNER

1. What is your country of origin?

2. What was your occupation in your native country?

3. How many members are there in your immediate family?

4. What year are you emigrating to Canada?

5. Travel Plans

Part 1 of the journey

Leaving date __________ Mode of Travel __________
Arrival date __________
Place of Departure __________ Place of Arrival __________

Part 2 of the journey

Leaving date __________ Mode of Travel __________
Arrival date __________
Place of Departure __________ Place of Arrival __________

Part 3 of the journey

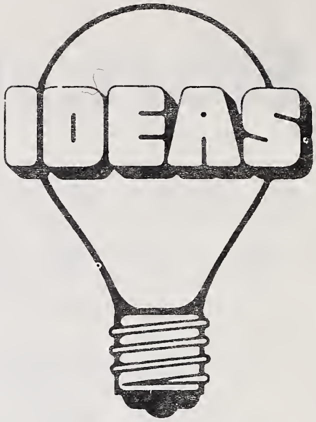
Leaving Date __________ Mode of Travel __________
Arrival date __________
Place of Departure __________ Place of Arrival ---------

Estimated total Cost of the Trip __________

Example:

Leaving Date April 3, 1907 Mode of Travel Ship
Arrival date April 21, 1907
Place of Departure Scotland Place of Arrival Montreal

Worksheet



PREPARING A PACKING LIST

Instructions to Students:

1. Have each member of your group list five items they would like to take with them to Alberta?
2. Make a master list.
3. Have a meeting and revise the list so that it is the most practical for your homesteading family.
4. Make a final list.

5. Compare your list with the pioneer's possessions list supplied with this lesson.
6. What did you forget? What may be unnecessary?
7. What do you plan to purchase when you get to Alberta?
How much money do you think a settler would need?

Worksheet

FAMILY MEMBERS PERSONAL PACKING LIST

NAME: ______________________

What is your relationship in the family. (Father, Mother, Son, Daughter, Aunt, Uncle.)

____

____

AGE: ____________________

I would like to take

1.

2.

3.

4.

5.

Homesteading in Alberta

In the 16, 17, and 18 hundreds Britain amassed a large net work of colonies. These new lands added to the wealth of the mother country by supplying raw materials for her industries. Initially the Canadian crop was furs. Trading posts were established and a brisk business was done in trade items such as beads, blankets and rifles for fur pelts.

Canada, later, wanted to populate the west in order to stabilize the Canadian economy and bring into agricultural production the vast fertile lands of the prairies. Lumber was harvested to build homes and places of business and the land was broken and seeded in the hopes of providing a surplus of grain for international trade.

An extensive advertising campaign was mounted to attract settlers to develop the farm lands of the west. Extravagant claims were made regarding the potential of the land. But the best offer was that of the homesteads which could be had for a fee of $10.00 and the subsequent fulfilling of the obligation of living on the land for at least six months of the year and opening up the land for cropping.

A brave and determined group of people arrived from all over the world to take advantage of this opportunity. Most were successful, making a major contribution to this province. In turn they had a place to call home, and in most cases a reasonable living.

In many instances the settlers learned about this new life by doing. Most families and individuals tried to make the best preparations possible, but what they really faced was the unknown. In many cases one of the reasons for moving to Alberta was that they were in some way restricted in their home land. They may have been unable to own land, or have political or religious freedom. If these were the circumstances, the lack of money was often a problem. Possessions were few and the limited space available for personal possessions which could be transported to Canada made the sacrifice of even more personal possessions imperative.

Some of the settlers came to Alberta, experienced farmers, ready to take on the challenges of mother earth. Many settlers came knowing other trades; shoemakers, blacksmiths and millers. In order to take advantage of the offer of free land, however, the rules had to be met. This meant, breaking the land and living on it. In many cases this meant learning by experience, or if you were lucky, someone was there to give you some good advice to help you get through the first few winters.

The cooperation of neighbours was a key to survival and the development of the land. In many communities one person would operate a saw mill while others made roads and built fences. Examples of team work were the building bees for barns and homes and later the threshing crew which made their way from farm to farm during the harvest season. Neighbours were also valued for the social contacts, which were often hindered by the rugged terrain which could separate one homestead from another.

People who chose to homestead in Alberta had a busy time ahead of them. Just the decision to move was enormous. Then came the planning. Which members of the family would come. In some cases all of the family would make the move, while in others only one or two members would strike out with the possibility of sending for the rest of the family once they were established. In any event, there was the inevitable choosing of what to take and what to leave behind. Practical items such as dishes and bedding were packed along side such impractical but cherished items as family photographs, a crystal vase and a mirror.

Travel plans were made. Usually there would be several modes taken before reaching the final destination. Ship, train and some form of horse or oxen drawn cart were common. The railways of Canada had a slim lead on the influx of eager settlers. Weary families were deposited at various train stations where they would start to learn the ropes of the acquisition and development of land in the west.

Camps of new arrivals were established at the major centers. From here, arrangements would be made to continue to their final destination. Additional supplies were purchased. Things such as flour, salt and other dried goods, as well as horses and livestock could be obtained at the larger centers. Advice was free. Leaving family members at the camp, the head of the household would travel out by wagon to view the land available for homesteading. Often only a corner of the land would be seen before filing a claim. In other cases, helpful residents of the area would suggest suitable quarter sections. Some settlers were able to make excellent choices. Others through inexperience and a lack of time were forced to make hasty decisions. Either way, homesteads were chosen and new residents moved onto the land.

Depending on the time of arrival, the settlers began work on their property immediately. Most would arrive with some form of portable shelter, such as a tent or a wagon box. These temporary arrangements would not serve as winter protection. The second home for the pioneers was also usually temporary. Made of the materials at hand it was small and crude. Where timbers could be found and cut, the shacks were constructed of logs. On the prairie, the first home was often made of sod. Many settlers spent their first, very bitter winter in a partially finished shelter.

Food was another consideration. The variety was often limited to the staple supplies such as biscuits made from salt and flour and what ever game could be had.

The first spring brought a rush of activity. Gardens were cultivated and planted, land was cleared and broken and repairs and improvements were made to the residence. Fences were constructed to contain livestock and trails were improved to allow for easier travel. A journey to the nearest store for supplies such as coal oil for the lanterns and even parts for implements might be in order.

These courageous people supported each other through the hardships of developing the homesteads. Providing assistance, encouragement and the much required relief from loneliness, they worked closely together. Some proved up their land and later sold it and moved to the towns to practice a trade, while others turned the virgin land into a profitable farming operation.

The result was homes and a livelihood for thousands of people. Traditional agriclutural practices were adapted to the needs of the land and the land provided for the needs of the people. Challenges were met and over come. Plans were made, adjusted, fulfilled and made again. Alberta's first industry was born. It remains one of the largest and most essential today. The production and distribution of food, - agriculture.

Throughout Alberta, evidence of these early pioneers can be found. Various sites have been preserved. Museums contain interesting relics of yesteryear. These historical sites and displays are only a part of the story. A drive through the country will reveal old homestead buildings and equipment, silent reminders of our, not so very old heritage.

Farm Homes

I like a kitchen big enough
To hold a rocking chair,
With windows looking to the sun,
And flowers blooming there.
I like big cupboards by the wall,
That hold a lot of things,
The cups hung up on little hooks,
A yellow bird that sings.

I like to do my mending there,
Where I can watch the road,
And see the teams come plodding home,
And smell their fragrant load,
Of heavy sheaves at stacking time,
Or hear the wagons creak,
And groan beneath their golden weight,
If it is threshing week.

I like to have the supper on,
And let it simmer slow,
With rich brown gravy bubbling up,
Around the meat, you know.
With apple pie set out to cool
And flaky new baked bread,
With golden syrup in a bowl
And jelly warm and red.

I like to have the lamps ashine,
With yellow glowing light,
And have the kitchen warm and clean
When they come in at night.
To make a home so snug and dear,
That when they work or play,
They hold a picture in their hearts
Of home, at close of day.

Beside Still Waters
- Edna Jaques

Pioneer Possessions

1. Spinning wheel
2. Wash board
3. Butter churn
4. Nails
5. Teeth for harrows (iron machinery parts)
6. Lanterns
7. Candle molds
8. Hunting Rifle and bullets
9. Iron Pots and Kettles
10. Special Kitchen tools
11. Special ornaments
12. Musical instruments
13. Iron
14. Sewing machine
15. Hand tools
16. Toys. Dolls. Model ??????? Soldiers, model horses and trains
17. Mattresses and bedding
18. Tables and chairs
19. Stoves and heaters
12. Carpentry tools

A pioneer explains how much it costs to buy supplies in Alberta.

"It is absurd to think of commencing with less than $600 or $700. Of course, I do not mean when more than one go together. Now take my case for instance. I and another young fellow went together and we bought at the lowest possible rates, and notwithstanding, our outfit for two cost us well on the $1,000 . . . "

"Now you take down the list of articles absolutely required," he said to the interviewer. "Yoke of oxen, $240; wagon, $80; plough, $25; tent, $12; stove, $4; two pair blankets, $9; Ox harness, $15; two axes, two saws, one hatchet, two augers, nails etc., $20; logging chain and ropes, $15; four months provisions, $100; total $520."

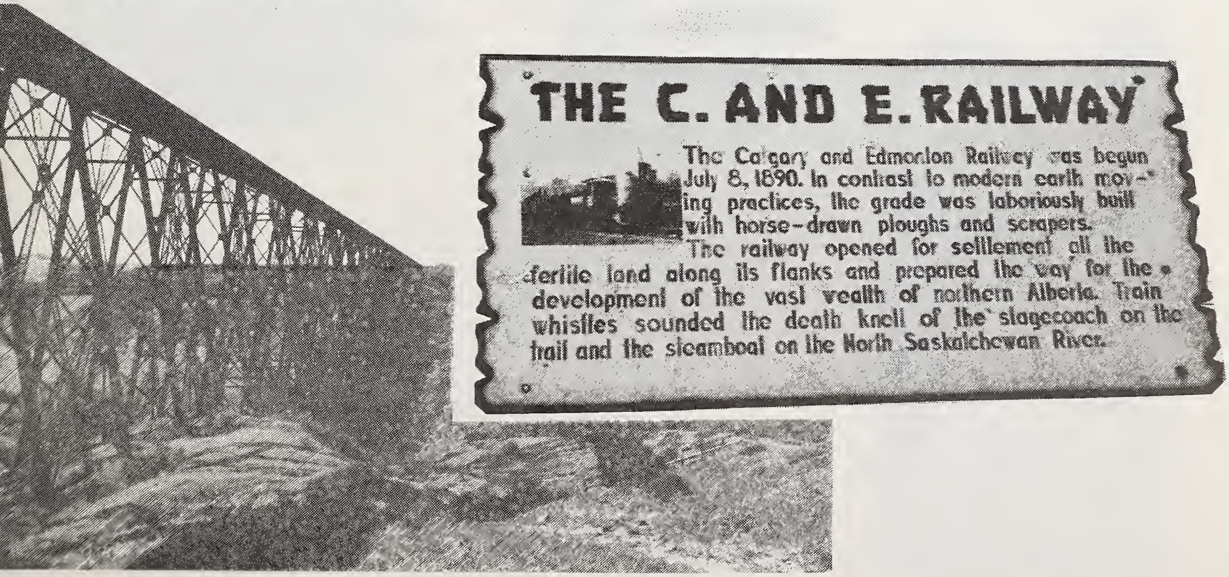
Pen and Plough

INTERESTING FACTS

1. In 1878, Mormon settlers moved into Southern Alberta from the U.S. and began irrigation farming.
2. In 1881 there were about 1,500 white and metis people living in Alberta.
3. In 1881 surveyors were dividing the land for development.
4. Alberta towns in 1881 were: Edmonton, Calgary and Fort Macleod.
5. The first Agricultural Society was established in Edmonton in 1879.
6. Ranching flourished in Alberta in the foothills and Cypress Hills area (where the chinooks are frequent) from 1880 - 1900.
7. In 1883 the railroad was completed to Calgary. A stage coach made connections to Edmonton.
8. In 1891 the railroad was completed to Edmonton.
9. In 1897 klondike gold fever hit. Edmonton became a main supply center.
10. In 1897 the railroad was completed to Lethbridge.
11. In 1911 there was record settlement. 20,000 acres were settled each day. Two new towns were founded each week. Four miles of railroad were built each day.
12. In 1912 Edmonton was a real estate empire. Thirty-two real estate brokers, 135 financial agencies and 336 real estate agents.
13. In 1914 oil was found in Turner Valley near Calgary.
14. Farming population increased from 127,379 in 1906 to over 300,000 in 1914.
15. Acres cultivated increased from 650,000 in 1906 to 2,500,000 in 1914.

Charles Bremmers Mother 1910. Provincial Archives of Alberta. E. Brown collection B413

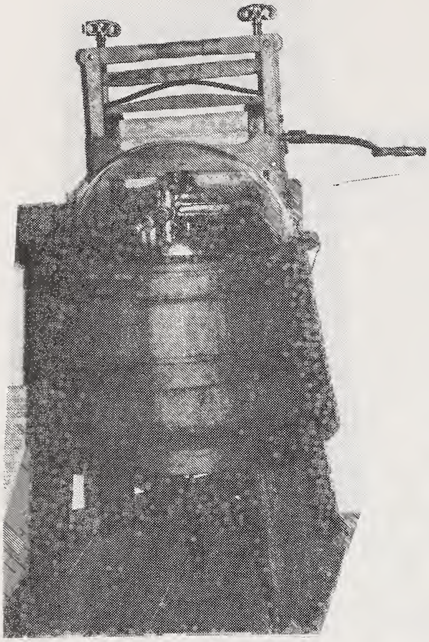
Settler poses in fashionable clothes

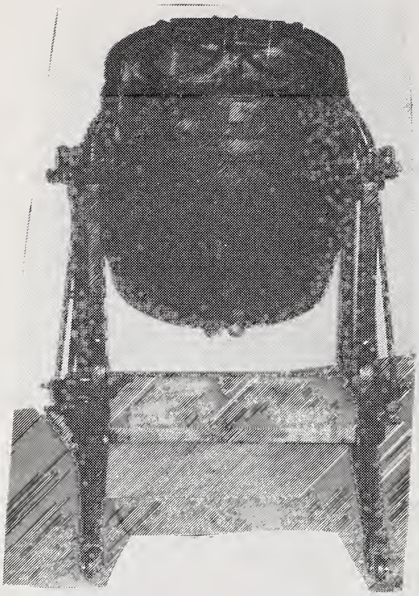


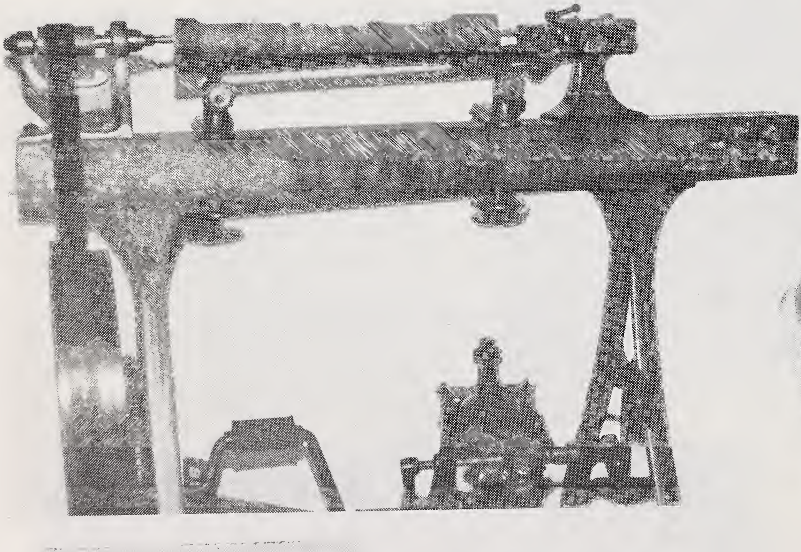
THE C. AND E. RAILWAY

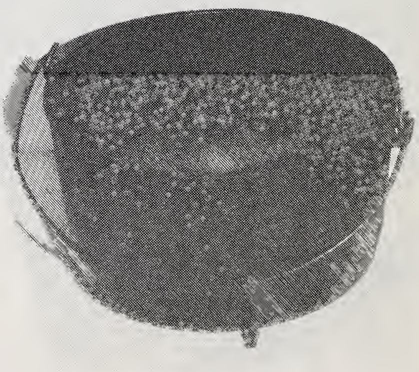
The Calgary and Edmonton Railway was begun July 8, 1890. In contrast to modern earth moving practices, the grade was laboriously built with horse-drawn ploughs and scrapers.

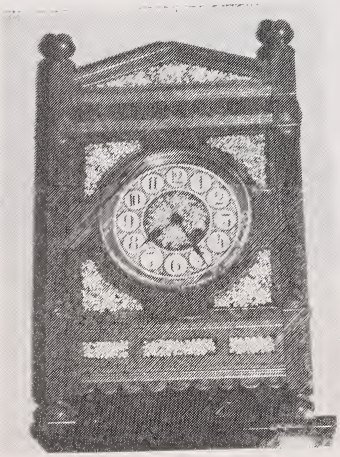
The railway opened for settlement all the fertile land along its flanks and prepared the way for the development of the vast wealth of northern Alberta. Train whistles sounded the death knell of the stagecoach on the trail and the steamboat on the North Saskatchewan River.











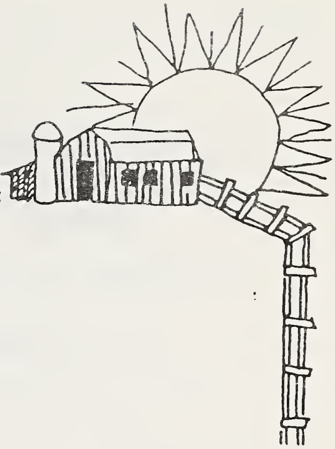
Settlers Effects

- included necessities
  and cherished treasures

1. Hand operated washing
   machine.
2. Barrel butter churn.
3. Hardanger voilin from
   Norway.
4. Foot driven wood
   lathe
5. Iron cooking pot.
6. Ornamental clock.

Lesson 6

PIONEERS AND PLACES II



Finding the Homestead

Subject Area:	Social Studies Grades 4 and 6
Curriculum Direction:	- How people in earlier times met their needs. - Alberta past, present, future. - Major factors that influenced settlement. - Transportation. - Natural resources.
Major Concepts:	Development, growth, change, resourcefulness life style.
Lesson Concept:	The development of Alberta was the combination of human desire for change, political readiness and demand. Settlers provided the human resources to implement the Government of Canada's plans for development of the west.
Purpose:	- To improve planning skills. - To experience some aspects of the early Alberta settlement. - To develop decision making skills - To share experiences and feelings with the settlers who chose to move onto the homesteads in Alberta.
Materials Required:	- Work sheets contained in this lesson - Art supplies, clay, sticks - Miscellaneous supplies which may be collected as required. (Example, moss).
Time Required:	1 - 4 class periods.

To the Teacher: Review the resource in lesson 5 to assist with this lesson.

PROCEDURE:

Part 1

Introduction:

1. Discuss the maps in this lesson that show the early Alberta settlement patterns.
2. Look at the ecoregion map in lesson 3.
3. Look at the pictures provided of early towns in Alberta. Discuss some of the common features. What can the children see?

   a. dirt streets
   b. small buildings
   c. some typical buildings - business

1. If the class has done Lesson 5 have them keep the same groups for Lesson 6. If they have not done Lesson 5, divide the class into groups of 4 to 6.

Part 2

Orientation

2. Teachers may want to help the groups decide where they would be arriving based on the settlement map and the time each group - family chooses to emigrate.

   Groups should then make a note of the general ecoregion they have chosen so that they can better describe their farm.

3. Have each group do the "Where Am I" Worksheet.

Part 3

Selecting

4. Have students imagine that they will now find their homestead. Discuss the procedure of obtaining land in Alberta. They have to find the land they want, then file

at the land office for title, pay $10.00 and agree to live on the land 6 months of the year and make improvements such as fencing and cultivation.

5. Have each group do the Homestead Work Sheet.

Conclusion:

1. Share the information on the worksheets with the class.
2. Prepare a large map of Alberta and show where the class pioneer families have settled.

Related Activities:

1. Plan a typical pioneer social function for your pioneer families such as a box social or community dance.

Dawn Called

Dawn called! And out across the plain
I heard the prairies move again;
I smelled the sage when dawn uncurled
Her leaves, for incense to the world;
I heard a meadow-lark get up
And pour its song in day's new cup.

I was the horses, dim and still
Against the shadow of a hill,
Stand up and shake the sleep away,
And snort their challenge to the day;
The roosters called across the plain
Their thanks that light had come again.

I saw Dawn walk with gracious feet,
Upon the billows of the wheat;
I touched her garments as she passed
Into a farmer's house at last,
And laughed to hear him softly stir
Against the lily hands of her.

I saw blue smoke upon the air,
I heard a woman singing there,
Close by the door and saw her stand
And breathe the fragrance of the land;
And heard her laughter, clear and sweet,
Echoing out across the wheat.

Dawn called! The prairies answered her;
I saw the grasses wake and stir;
I heard the breathing of the air;
Felt Life abundant everywhere;
Saw the glad Earth, where shadows run
Drawing her substance from the sun.

Beside Still Waters
- Edna Jaques

Worksheet

WHERE AM I?

1. The train stops. You gather up our belongings and step off the train on the station platform.

   The sign tells you you are in what town? ____________________

2. How many people get off with you? ____________________

3. Where will you stay until you find your homestead and collect your supplies? A hotel, boarding house, tent?

4. What are some of the businesses in this town?

5. What does the town look like?

6. Are the people friendly and helpful? Are there many people looking for homesteads?

7. What are the roads like?

Worksheet

THE HOMESTEAD

1. According to the time you arrived in Alberta, locate the possible areas for your homestead on the Homesteading map.

2. Now look at the ecoregions map and decide what type of land you expect to find in that area.

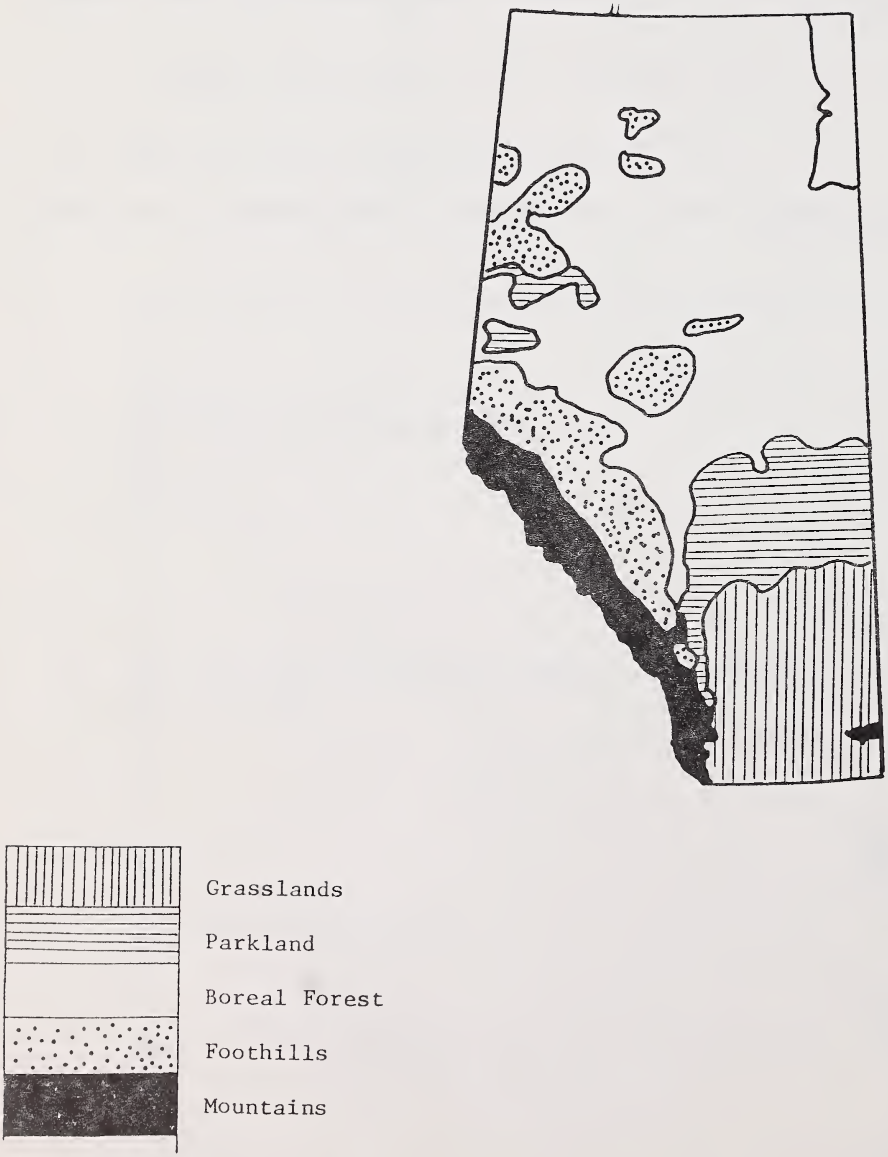
   - parkland
   - prairie
   - boreal forest

3. You have gone out to look at the land available and have chosen a homestead.

   Briefly describe the land. (Hills, trees, water, grass)

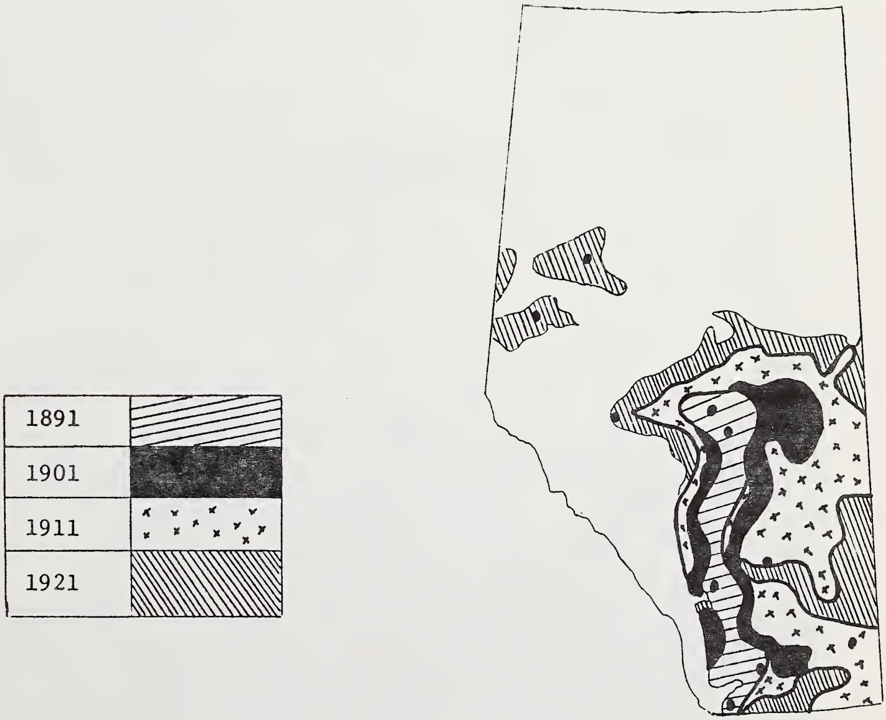
   Draw a general map of the features of your quarter section in the square below:

Ecoregions of Alberta

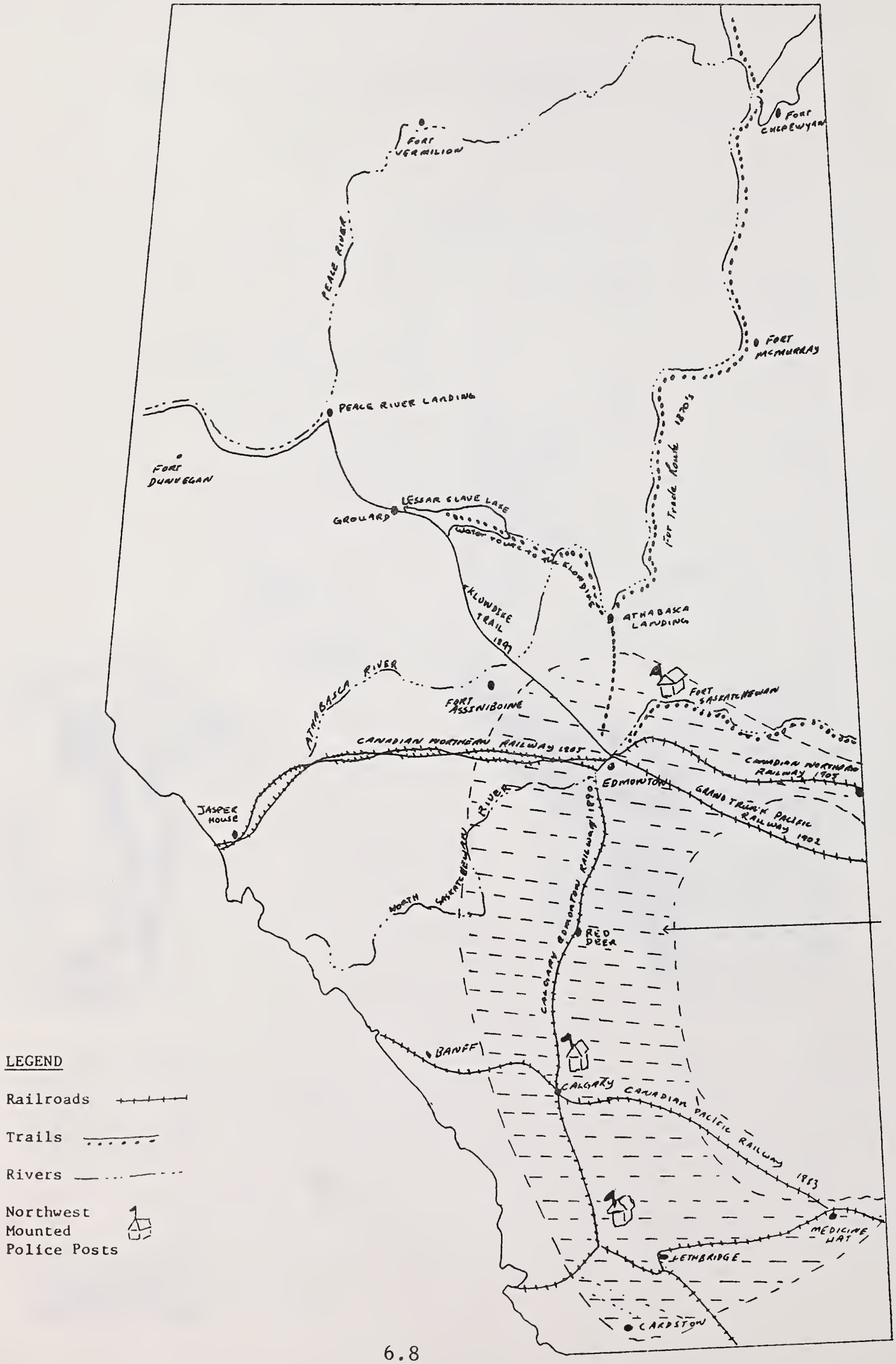


Settlement Areas

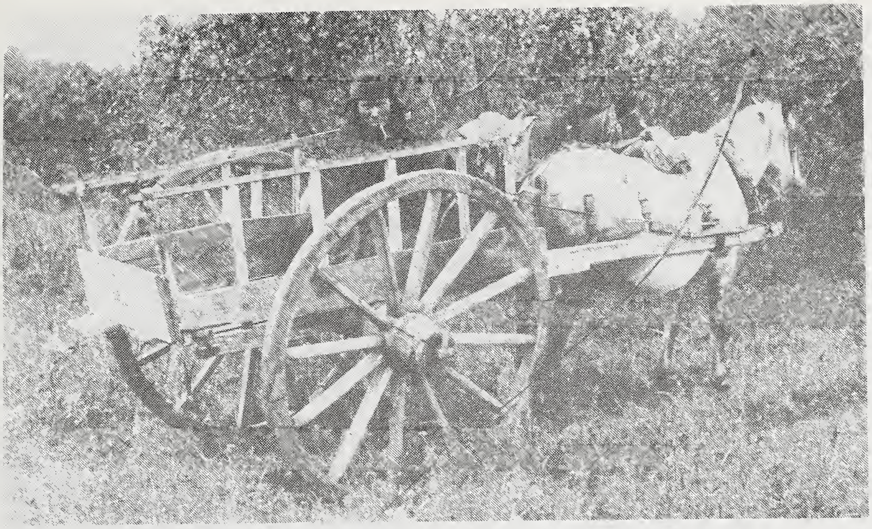
1891 - 1921



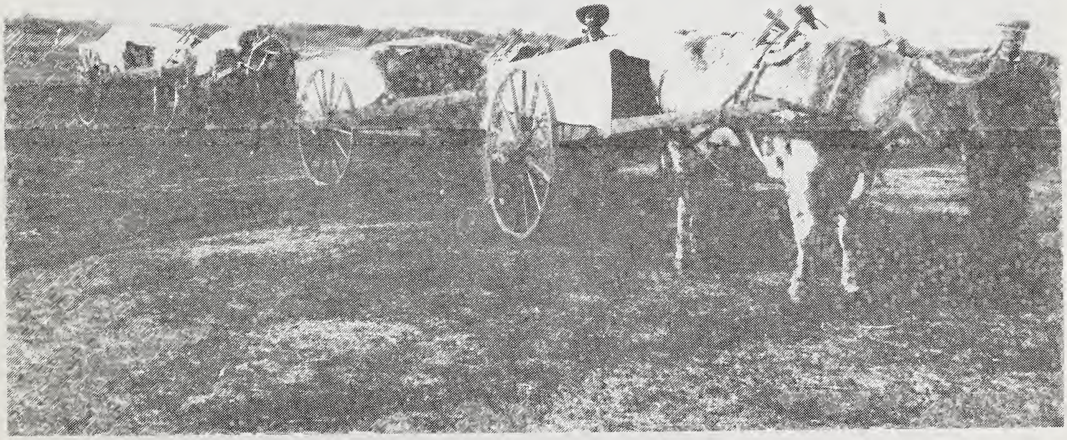
Early Development In Alberta



Settlement crescent 1906 - The bulk of homestead settlement was contained in this shaded area

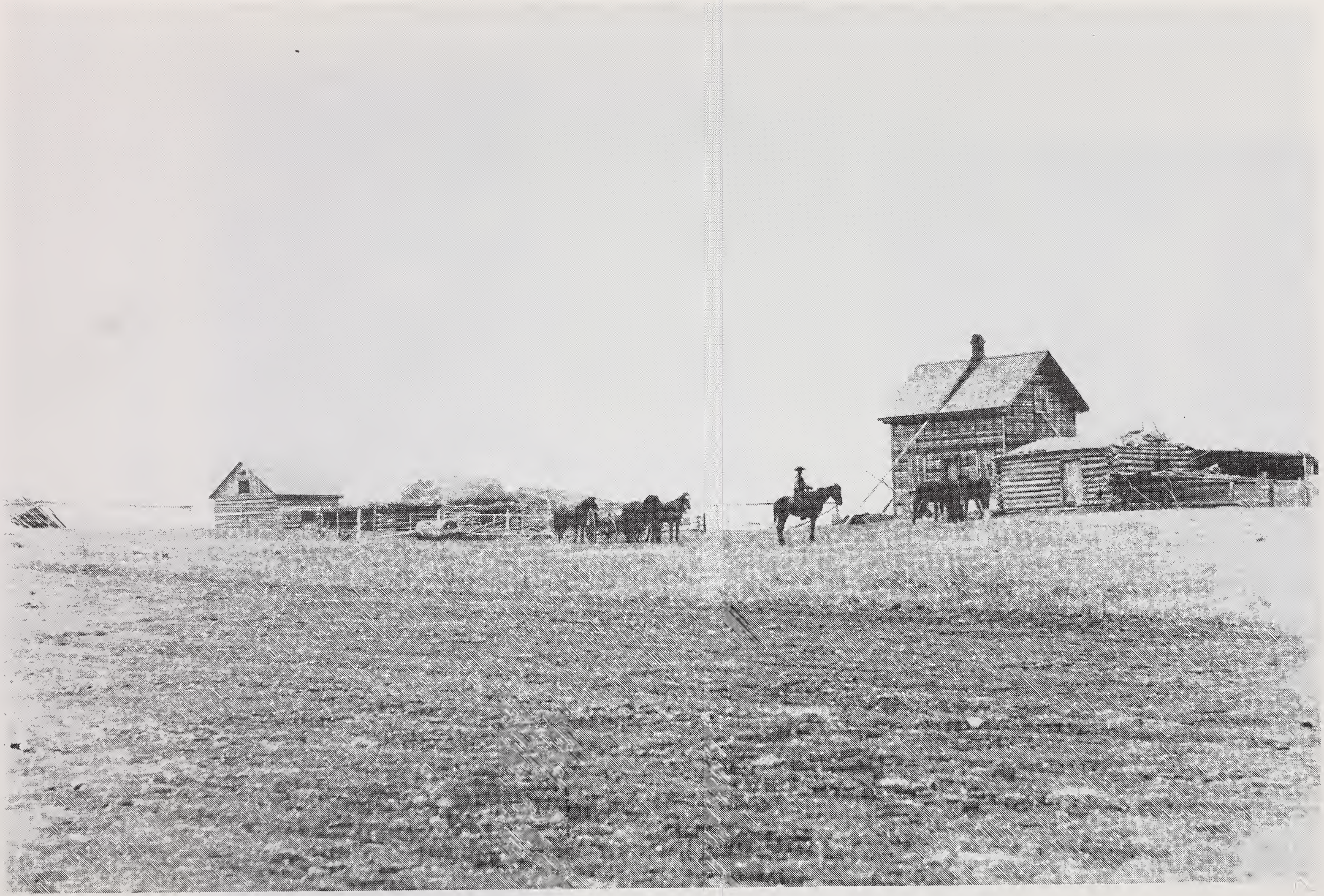


1. Red River Cart, Pony and Indian B1043



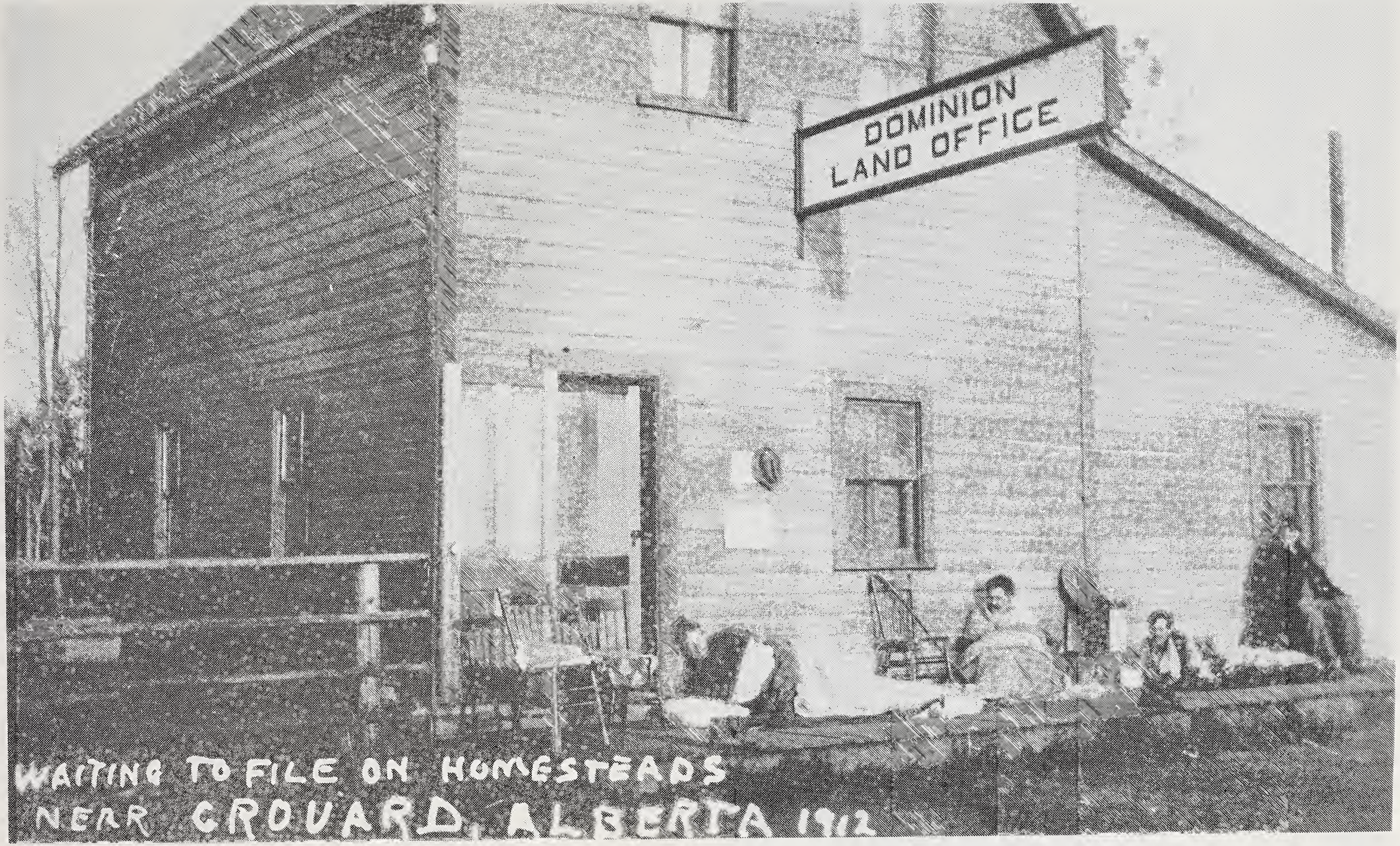
2. Ox Train on the outskirts of Edmonton returning from a trip to Calgary. 1891 - 1904 E. Brown Collection, B710

Provincial Archives of Alberta



Farm House near Calgary 1883 - E. Brown Collection, B119.
Provincial Archives of Alberta.

This homesteader built a frame and log home.



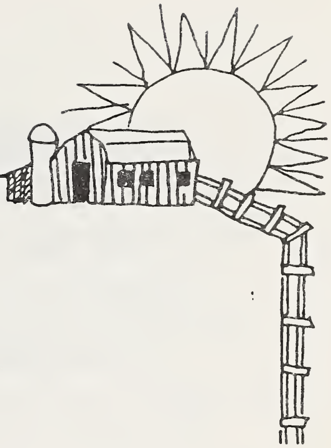
Waiting to file on homesteads near Grourard, Alberta, 1912 - A10185
Provincial Archives of Alberta

TOWN BUSINESSES PROVIDED SOME SUPPLIES FOR SETTLERS

(Above) Walker and Reid Store, Lamont, Alberta 1907 A11163

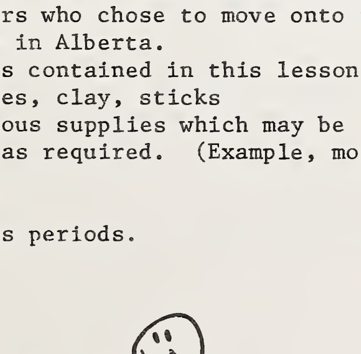
(Below) Lethbridge Looking South. 1884 - E. Brown Collection B2436
Provincial Archives of Alberta

Lesson 7



First Year on the Homestead

Subject Area:	Social Studies Grades 4 and 6
Curriculum Direction:	- How people in earlier times met their needs. - Alberta past, present, future. - Major factors that influenced settlement. - Transportation. - Natural resources.
Major Concepts:	Development, growth, change, resourcefulness life style.
Lesson Concept:	The development of Alberta was the combination of human desire for change, political readiness and demand. Settlers provided the human resources to implement the Government of Canada's plans for development of the west.
Purpose:	- To improve planning skills. - To experience some aspects of the early Alberta settlement. - To develop decision making skills - To share experiences and feelings with the settlers who chose to move onto the homesteads in Alberta.
Materials Required:	- Work sheets contained in this lesson - Art supplies, clay, sticks - Miscellaneous supplies which may be collected as required. (Example, moss).
Time Required:	1 - 4 class periods.



To the Teacher: Resource material in lesson 5 and 6 is useful for this lesson.

PROCEDURE:

Part 1

Introduction:

1. Discuss the various places pioneers settled. (If your class has done lesson 5 or 6, they will not need too much introduction to this lesson).
2. Discuss the Worksheet "My First Home".
   - Pioneers made homes from material that was at hand. Example, prairie farmers often lived in sod huts for the first year.
   - Parkland or forest homesteaders often made log cabins.
   - Some pioneers used tents or simple board shacks.

Part 2

Recording Information:

1. Divide the class into groups which represent pioneer families.
2. Have groups do the worksheet "My First Home".
3. Discuss the information on the worksheet.
4. Have the groups do the worksheet "Life on the Homestead".

Conclusion:

1. Ask each group to write a short story about their first winter on the homestead. Include comments from all members of the family/group.
2. Share the stories with the class.

For Discussion:

1. From doing these exercises, what have you learned about life styles 100 years ago in Alberta?
2. How have farm families changed?
3. What things are found in our kitchens today that pioneers would not know how to operate?
4. What did pioneers use instead of electricity and natural gas?
5. At an average of 20 miles a day, how long would it take you to travel to Calgary in 1883 to meet the train from your school?
6. What were some of the things you might do during your days if you were a child in 1901? Do you think you might have attended school?

Related Activities:

To get a real feel for some of the labours of the pioneer family, students may try some of the following:

1. Find a tree that the town or an individual wants removed and see if the class can dig it up, roots and all, using hand tools.
2. Dig out sods for a garden plot. Figure out how long it would take to cultivate 1 acre at the rate that they can do this chore.
3. Take a walk in a wilderness area and identify as many edible items as possible.
4. Have a wood chopping competition.
5. Make a model of a pioneer home. (log or sod - made of clay and moss)

6. Draw a large map of your quarter section which shows some of the features and explain to the class how the family developed the land.

7. Make some biscuits and/or other pioneer food to share with the class.

8. Preserve some fruit by drying or canning.

Homesteaders

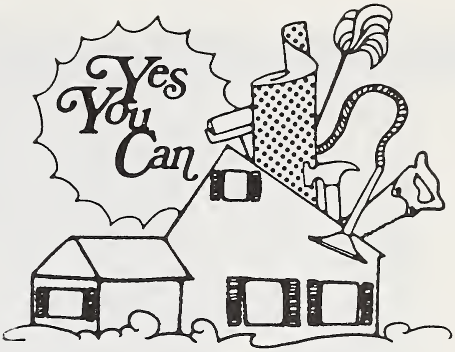
Pushing the frontiers further
Back with relentless hands,
Blazing the trail with a plowshare,
Far in the hinterlands;
Holding fast to their birthright,
Born to the realm of toil;
Bearded, grim and unconquered,
Ragged kings of the soil.

Building their lonely cabins,
Staking their homestead claim;
Beating the trail to Somewhere,
Steady, fearless and game,
Bounded by sky and muskeg,
Hedged by the vast unknown,
Earning their hundred and sixty,
Winning their fight alone.

Theirs is the dream eternal,
Hills that are rugged and green;
Lure of the far horizon,
Prairies, wind-swept and clean.
Visioning towns in the making,
Faith in the intried lands,
Holding the country's future,
Safe in their calloused hands.

Beside Still Waters
- Edna Jaques

Worksheet



MY FIRST HOME

1. What building materials did you use?

2. Who built it?

3. How big was it?

4. What kind of furniture did you have?

5. Was your house comfortable?

6. Draw a picture of your first home.

Worksheet

LIFE ON THE HOMESTEAD

1. Can you name a piece of early machinery you may have used on the homestead?

2. Did you have a horse or an ox to help with the work?

3. What was some of the food you ate?

4. Where did your food come from?

5. Where did you go shopping?

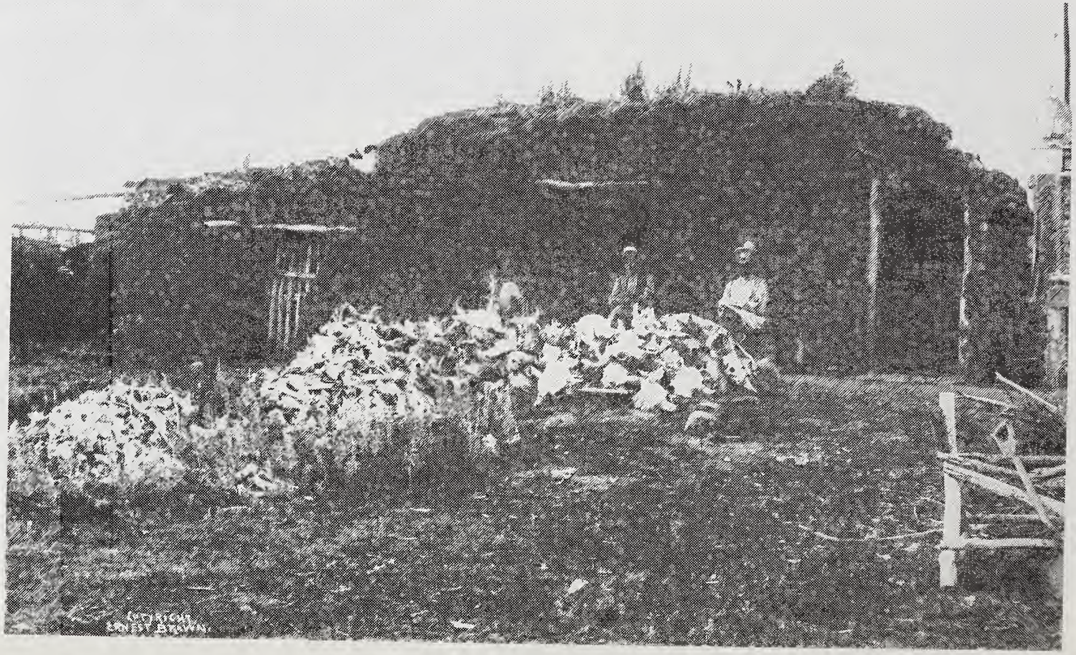
6. How did you travel from place to place?

SOD HOUSES

- the students model.

- Hines Creek Student displays a model of sod hut.

- the settlers model



Sod House
"The beginning of
better things".

Buffalo bones in
front - 1904

E. Brown Collection
B723 Provincial
Archives of Alberta

Co-operation makes a hard job easier.

- Barn Raising Bee
- Red Water District
  1930 A2216

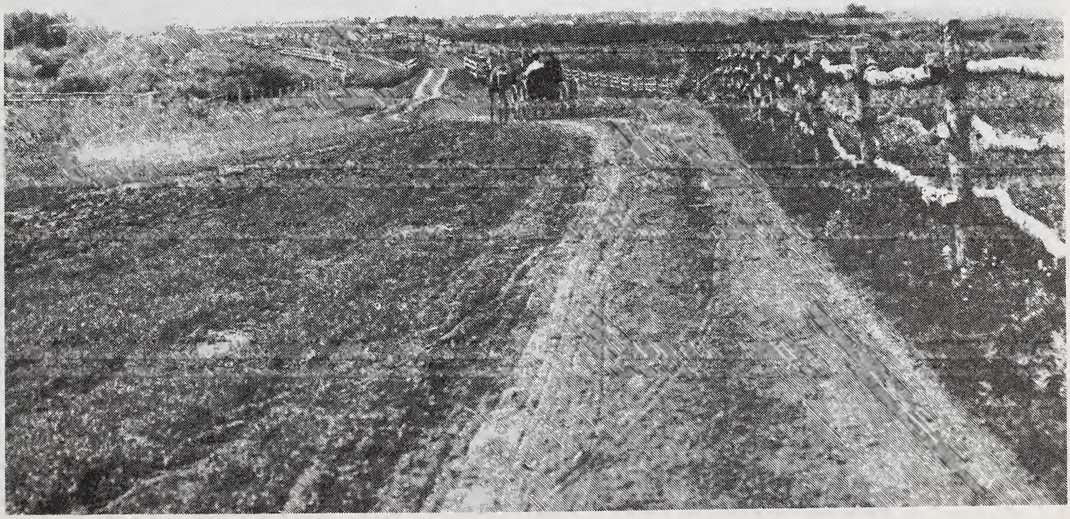
Provincial Archives of Alberta

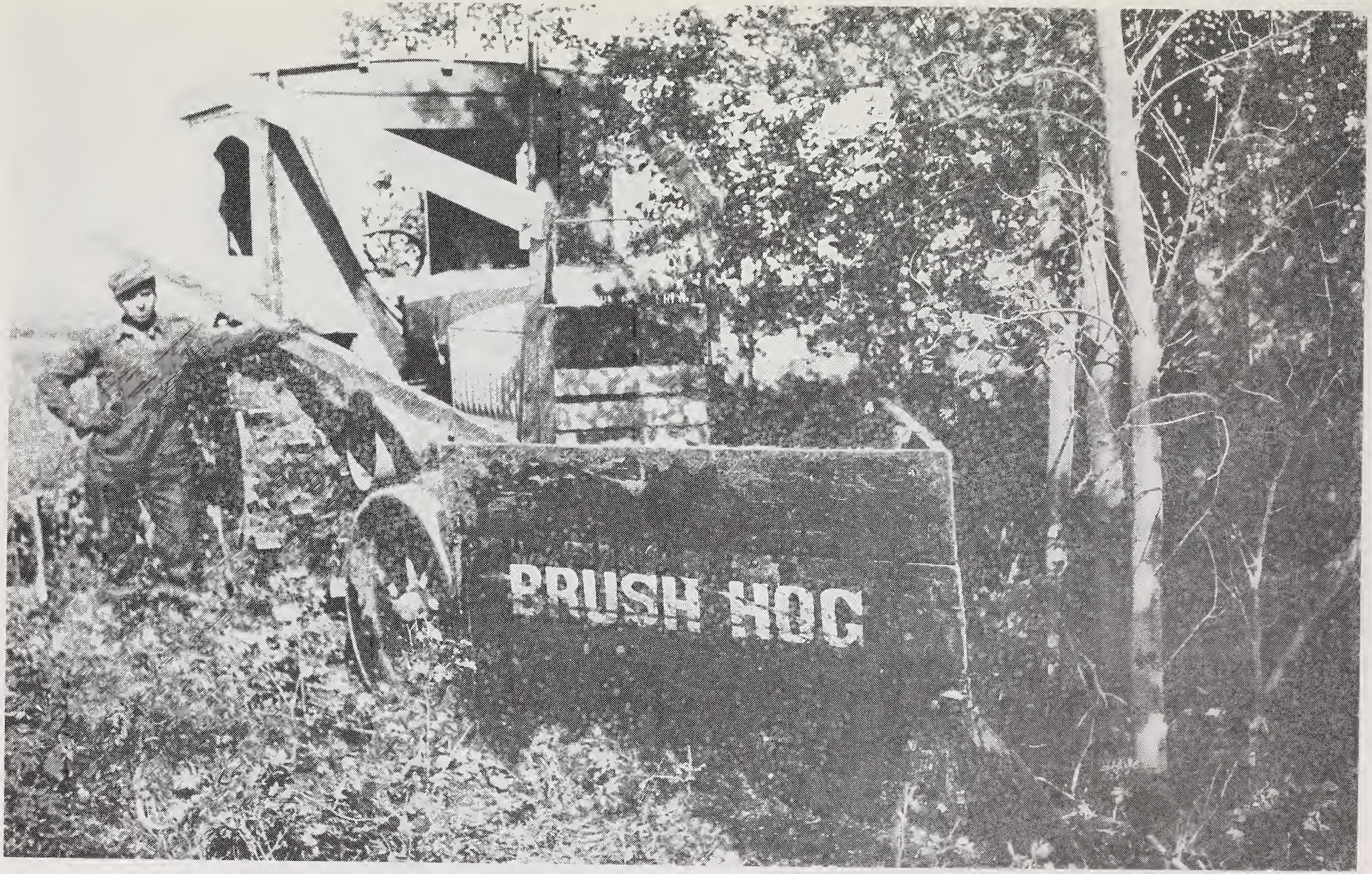
Stooks in front of an old barn at Fort Edmonton Park

Al Kosmak

SOME HOMESTEADERS FOUND WORK IN THE TOWNS
- Steam ditcher at work, 1907. E. Brown Collection B1316

TRAVEL IN THE SUMMER SEASON COULD BE PLEASANT
- The Fort Saskatchewan trail, 1891 - 1904. E. Brown Collection B716
Provincial Archives of Alberta

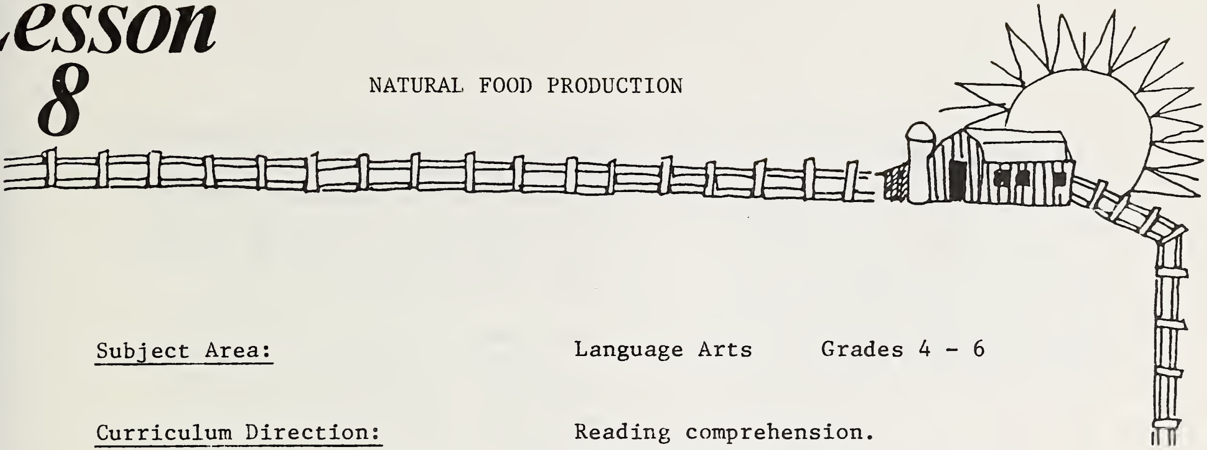




MACHINES WERE INVENTED TO HELP WITH THE WORK
- "Brush Hog" McCormick Deering Stettler Alberta A7753.
Provincial Archives of Alberta

Lesson 8

NATURAL FOOD PRODUCTION



Subject Area:	Language Arts Grades 4 - 6
Curriculum Direction:	Reading comprehension. Speaking to the issue.
Major Concepts:	Taking a stand. Technical and chemical development.
Lesson Concepts:	We are frequently called upon to give an opinion on various issues. How are we influenced by what we read and hear? How important is it to be well informed?
Purpose:	1. To improve reading comprehension. 2. To synthesize responses to questions from literature. 3. To practice speaking skills and improve communication skills.
Materials Required:	Supplied in this lesson Further Information - "Fertilizers and Herbicides".
Time Required:	2 class periods

To the Teacher:

This activity is not designed to have students establish the best method of raising food for human consumption. Rather they are encouraged to take a stand and voice an opinion without fear of being right or wrong.

The lesson contains 2 separate activities. Activity 1 deals with issue #1 - farming practices and Activity 2 deals with issue #2 - processing practices.

Introduction:

This lesson contains information which supports both conventional and organic farming methods. There are many strong opinions about the use or non-use of chemicals in food production and packaging. There are two issues presented:

1. Farming practices and chemicals.
2. Processing practices and non-food additives.

ACTIVITY #1 FARMING PRACTICES

PROCEDURE:

Part 1

Gathering Information:

1. Divide the class into two groups. Give group A the essay "Back to Basics". Give group B the essay "Modern Food Production".

NOTE: For younger students, use "Whats in the Food we Eat" and "A Hungry World Demands Food".

2. The class has 10 minutes or less to read over their material. Groups may be allowed to discuss the information before the interview. The students will be reading to find arguments for or against Organic or Conventional farming practices. Issue #1.

Part 2

Giving Opinions:

3. The teacher or a student may conduct the "Man on the Street Interview". Questions may be those provided in this lesson or the interviewer may make up his/her own. Make sure that all students are asked the same questions.

NOTE: The class may stage a panel discussion with the teacher acting as the co-ordinator.

Part 3

Evaluation:

Students will be graded on the following:

1. How well they understood the material.
2. Did they answer the question.
3. Was their answer clear and concise.
4. Enthusiasm.
5. Are they convincing?

To help students with their evaluations, they should be made aware of the things the teacher is looking for in the responses.

Evaluation form is provided.

The interviews should be taped so that the whole class can hear the responses once the exercise is complete.

Conclusion:

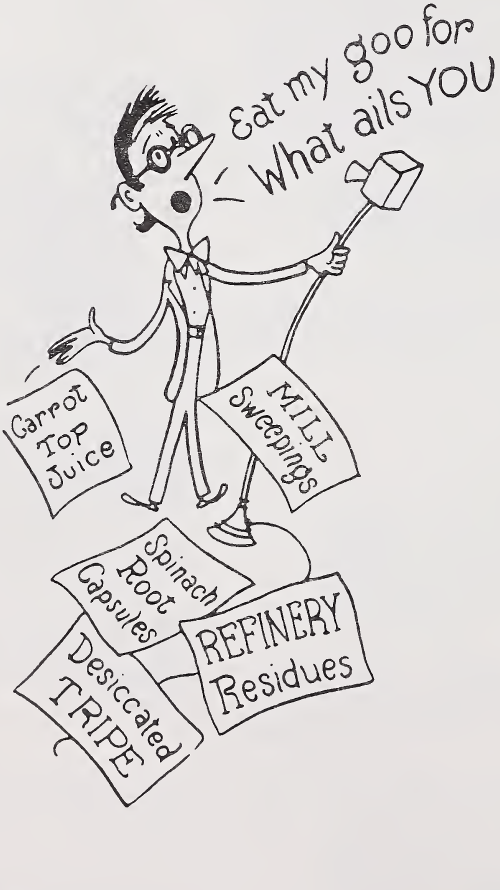
Play back the discussion or interviews to the class.

For Discussion:

1. After listening to the tape, would you change some of your opinions? Why? Is it good to have opinions? How can we be well informed?

Related Activities:

1. Exchange essays and interview the class again.
2. Conduct a Man on the Street Interview about a controversial topic in your school. Example, dress code, smoking, homework.
3. Compare prices and quality of food goods in a health food store or a market. Read labels.



ACTIVITY #2 FOOD PROCESSING PRACTISCES

PROCEDURE:

Part 1

Introduction:

Bring an example of a packaged food. Read the label to the class. Are any of the ingredients non-food items?

Part 2

Compiling Information:

1. Ask each student to bring a food packaging label to class.
2. Read all the labels.
3. Make a chart to group non-food ingredients.

4. Group the non-food additives by their names. Example:

    - artificial color
    - monosodium glutomate
    - unrecognizable chemicals

Conclusion:

Make a display or collage of all the labels and put the ingredients chart at the bottom.

For Discussion:

1. What is the most common non-food additive in the packaged food sampled?
2. Are foods without preservatives or additives common on the supermarket shelves?
3. Why are these chemicals added to our food?

Related Activity:

1. Make a list of as many pure food items as you can find on your shelves at home or in the store.

2. Find out what some of the chemicals are and what they are used for.

Suggested Interview Questions:

1. Do you feel that chemicals should be used in the production of human food?

   Why?

2. How could the production of human food be improved for quality and quantity?

3. What would happen if the use of chemicals were prohibited in the production of human food?

Student Evaluation

Ratings out of 10. Total possible score = 50

NAME	Understands Material	Answers the Question	Speaks Clearly	Enthusiasm	Argument Convincing	TOTAL SCORE

WHAT IS IN THE FOOD WE EAT

Fight against the addition of chemicals in your food.

Read the list of ingredients on almost any food label and you will find many non-food substances. Most of these chemicals are added when the food is processed and packaged. There may be other chemicals present in your food that you do not even know about.

Poisons! These are used by farmers to grow their crops. Many are sprayed directly on to young plants. These deadly substances are called Agricultural Chemicals. They have several uses. Fertilizers are added to soils to make plants grow. Weed killers are added to the soil or fields. Insecticides are poisons which are sprayed or dusted on plants to kill bugs. They are not good for you either.

The use of these chemicals has been increasing since World War II. Chemicals have helped to make the farmer's job easier. But what are they doing for you?

Plants can be grown without large quantities of chemicals. Just look at any park or unsettled area.

You can help to reduce the chemicals you eat by choosing food that has been grown naturally. By reading package labels you can select food which has limited added ingredients. Together we can fight for pure good food!

A HUNGRY WORLD DEMANDS FOOD

Todays Farmers get better crops.

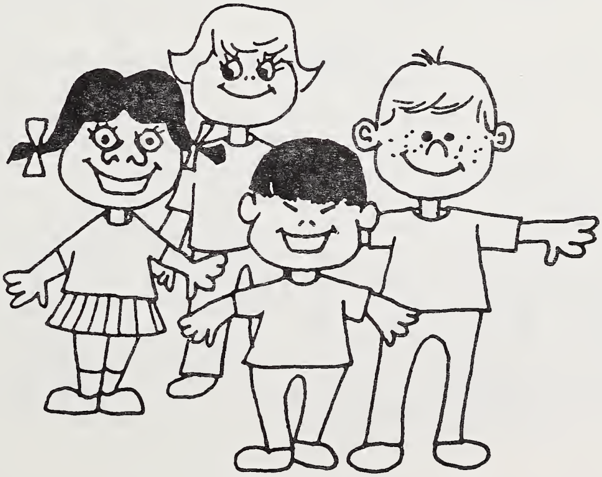
Alberta grain fields are more productive than ever before. Farmers are using modern technology to grow more high quality food.

One of the things that has helped farmers the most is the development of chemicals that can be used for the following purposes:

1. To control weeds.
2. To make plants grow large and produce more food.
3. To kill harmful pests such as insects and disease.

Alberta Farmers are using modern equipment and the latest in chemical technology to make sure that there is enough food for you and a surplus of food to help feed some of the world's less fortunate people.

We can not make more farm land. We can only make the farm land we have more productive. The careful use of chemicals will help farmers grow the food for our hungry world.



OPINION

BACK TO THE BASICS

In recent years, we in the Western world, have strayed further and further from some of our natural and essential human needs. We have introduced unnecessary complications into our every day lives which have resulted in a marked increase in stress related ailments.

Probably the area of excess development which affects the greatest numbers in our population is the food industry. Not too many years ago, we could trace the origins of the food we ate. Much of it we produced on our own land. However, with the move towards urbanization, most of Alberta residents depend on produce and meats sold by supermarkets. We remain ignorant of the agricultural practices involved in producing the food we eat. Blindly we choose from the variety on display and proceed to eat the residues from chemicals which are commonly used to grow the crop species. These chemicals, commonly called fertilizers, herbicides and insecticides become an integral part of the food we eat. How safe are they? Many of these chemicals are so recent that their long term effects are unknown.

The food manufacturers are not satisfied with the introduction of chemicals to our food supply during its growth stages. They proceed to add even more chemicals during the packaging or production, aimed at increasing the shelf life of the product. This does not benefit the consumer. It simply ensures the retailer a profit by being able to hold the food for longer periods of time.

What are some of the alternatives to this chemical overdose you are probably wondering. This is agriculture today. Probably the most modern in the world. One option is getting back to the basics of the natural life cycles and adopting the practices of organic farming. Organic farming might also be called natural farming. In either case we refer to a method of food production which utilizes organic fertilizers and natural control of weeds and pests. These methods are entirely safe for humans. They leave no harmful chemical residues on our food. Nor do they depend on individual integrity where the use of toxic chemicals is concerned. An example may be the use of wormers on animals destined for slaughter, the regulations may require that none of these highly toxic chemicals be used within two weeks of slaughter. However, tests are not done on all animals to ensure these regulations are being adhered to. Government inspections fall far short of being able to totally control this type of abuse of the chemicals at hand.

Organic farming practices the recycling of wastes in accordance with the laws of nature restoring the soil to its own natural balance. Foods grown on healthy soil are naturally more nutritious. The organic methods can be easily practiced in home gardens where they directly benefit the producer. These methods can also be practical on a larger scale for production of foods for the market.

Organic farming is easy, available and simple. All that is required is for the producers to recognize their responsibility to produce nutritious pollution free food for Albertans. It is easy because it only requires a modest knowledge of natural cycles and interdependency. It is available since the prime requisite is organic material which is inexhaustible and may only need transportation to the growing site. It is simple, no expert knowledge of chemicals, trace minerals and poisonous sprays is required.

As we continue to be concerned about the alarming rate of nutrition related ailments, we should begin to make choices regarding the food we eat. Consumers can influence the producers by selecting some products while rejecting others. Alberta farmers can be encouraged to return to farming methods which complement natural cycles while producing food which is safe and nutritious for human consumption.

OPINION

MODERN FOOD PRODUCTION

A hungry world demands food. Mechanical, biological and chemical innovations join hands to meet the needs of the world's ever growing population.

Today virtually all of the best agricultural land is in production. In heavy production, dairy cattle are producing more than twice as much milk per day than they were 100 years ago. Grain fields stand shoulder to shoulder, slowly turning golden, ready for another massive harvest. And agricultural production is still on the rise.

Efficient, specialized machines assist the farmer with his labour requirements. Some tillage equipment is specially designed for dry areas where a trash layer left on the surface helps to ward off erosion. Other cultivators move down the rows of potatoes. Tilling and hilling the plants in one action. The range and supply or equipment is extensive - and expensive. Our world cannot afford to have a crop failure and neither can our farmers.

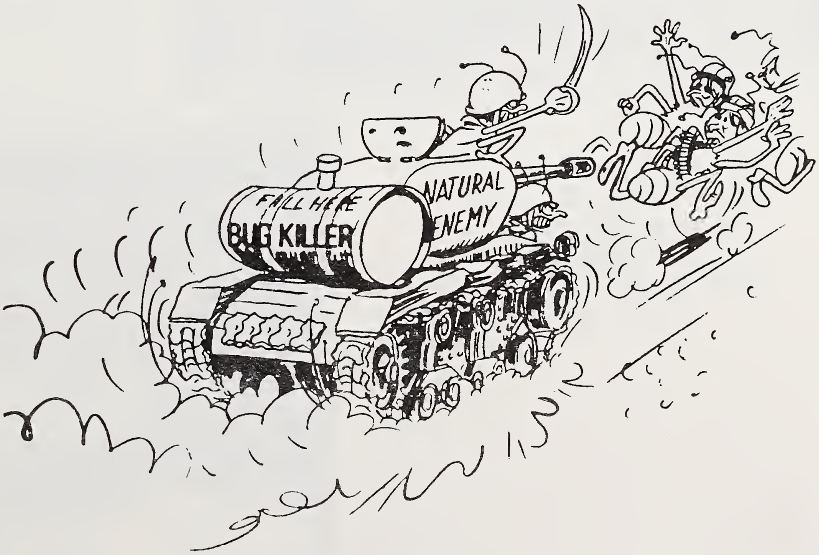
To prevent the catastrophe of agricultural failure, chemists and biologists have been effective in improving the chances of maximum production. Biologists have bred plants that are resistant to disease, produce higher yields and can ripen in a short season. They have also been able to breed animals which can produce more milk, grow faster, bear more offspring and do all of this on less feed per pound of product.

The contribution of chemistry is one of the most controversial in the business of Agriculture. Chemicals are used in conventional agricultural practices in Alberta to assist production in a variety of ways. They can be used to improve the fertility of the land, control pests which attack crops and reduce yields, which include weeds, insects and disease. They can control livestock pests - internal and external parasites and disease. Chemicals can make farm management efficient and effective! Farms which use chemicals as recommended produce 15 - 25 % higher yields than those that depend on organic methods. The result of this increased yield on the farm is increased savings at the super market. In addition, the products are usually unblemished and insect and disease free.

Farmers who employ the use of chemicals to aid in their production also utilize the practices that have been traditionally used in agriculture to improve the land and maintain healthy livestock. They are able to return more organic materials to the soil after harvest because of increased yields. For example, during the combining operation, only the seeds are removed from the ripe plant. The remaining straw is usually chopped and cultivated back into the soil. Chemical fertilizers are then added to the soil in the spring to bring the soil to its optimum fertility level. Chemical weed killers are applied at various times to control these unwanted plants which can significantly reduce yields. The weed seeds can contaminate the grains harvested which will then require extensive cleaning before the grain can be utilized. The use of herbicides (weed killers) allows the farmers to use the best method of cultivation for the land. Over-cultivation can cause serious soil losses due to erosion. The use of chemicals can reduce these losses.

What about the safety of chemicals used on farms and does the origin of the chemical make it more dangerous. First, a chemical becomes hazardous only when the degree of exposure is sufficient to cause toxic effect. This means that as long as the amount of chemical is small enough it will not have negative effects. The use of agricultural chemicals is closely regulated and the recommended applications are well within the safe tolerance for human use. Chemicals can be derived from both natural and inorganic sources. Once the chemical is isolated, it has the same effect no matter which source it originated from. For agricultural purposes, usually the most cost efficient source is used which enables farmers to keep their production costs as low as possible.

Alberta agriculture is keeping pace with the needs of Albertans and supplying a surplus for Canadian trade. The yields and the quality of the product is higher than they have been in the past. These improvements can be attributed in part to the careful use of chemicals on our farms.



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Organic Agriculture. Economic and Ecological Comparisons with Conventional Methods.
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Back to Eden
Jethro Kloss

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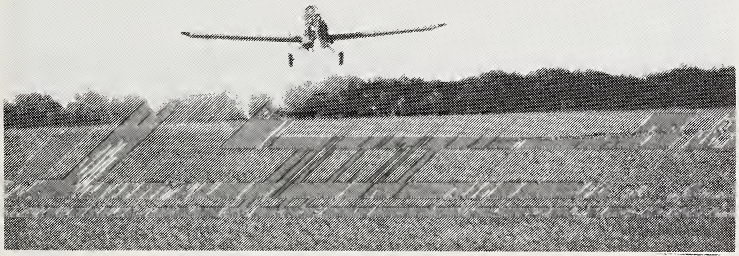
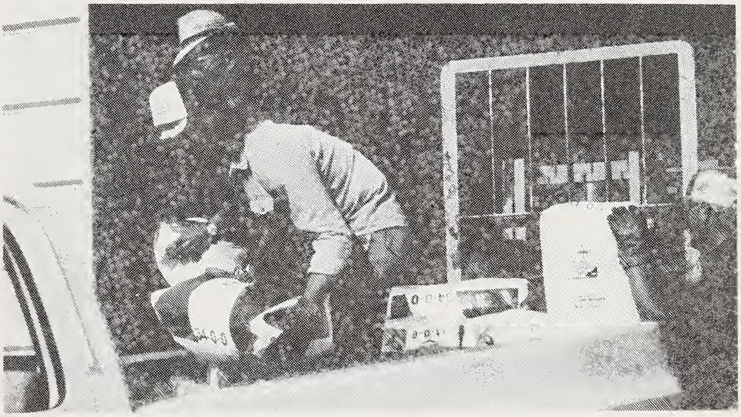
Good Food Naturally, How to Grow it, Cook it, Keep it.
John B. Harrison



Crop dusting

and

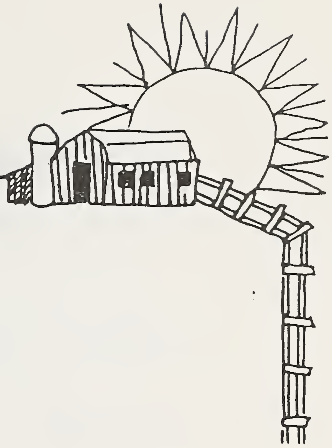
Chemical fertilizers



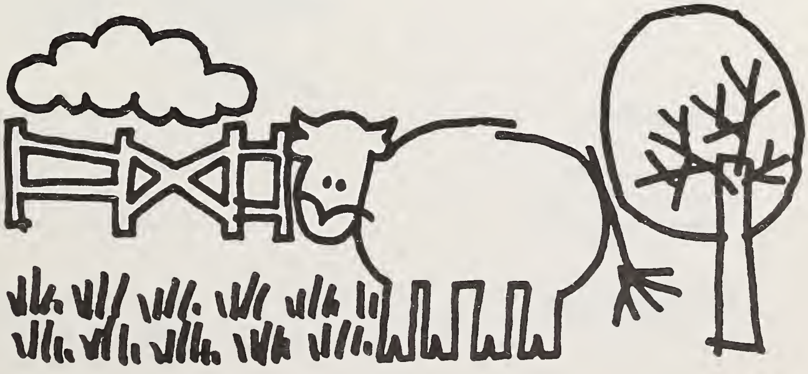
help farmers
produce high
yeilding disease
free crops.

Lesson 9

LEARNING THE LANGUAGE



Subject:	Language Arts
Curriculum Direction:	Building Vocabulary
Major Concept:	Effective communication requires a good vocabulary.
Purpose:	- To introduce students to some terms commonly used in Agriculture. - To assist students in learning how to use and apply definition.
Activity:	Crossword puzzle
Grade:	5 & 6
Time required:	2 - 3 class periods.



To the Teacher:

This lesson can be used for self enrichment by students. The directions are simple and since it is a familiar activity for students at this age, they should be able to complete it with little or no assistance from the instructor.

PROCEDURE:

Part 1

Introduction:

The first step in the study of any new subject is to become familiar with the associated vocabulary. This lesson provides a simple glossary of common agricultural terms. The students can test their understanding of agricultural terms by attempting to complete the crossword puzzle.

Part 2

Building Vocabulary:

This lesson may be done one of two ways:

1. Review the vocabulary provided and then test your knowledge of the terms by working on the crossword puzzle.

2. Try to complete the crossword puzzle. Use the vocabulary definitions to assist you where required.

Conclusion:

Have the students choose three words that they have never seen before. They should try to use them in a sentence. This can be a written or an oral assignment.

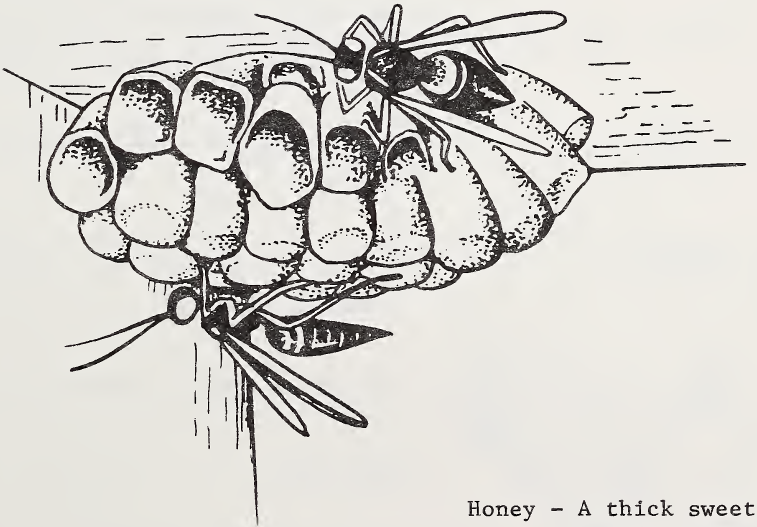
For Discussion:

In a class discussion, see how many of the students found this exercise a challenge.

1. What were the most common words?
2. Which words were generally unfamiliar?

Related Activities:

1. Have the students create illustrations for some of the terms in this vocabulary list.
2. Have a spelling bee using these words.
3. Find the words in this list that belong to main groups such as grains, names of animals, agricultural products.



Honey - A thick sweet fluid prepared by worker bees.

Learning the Language

Vocabulary

Apiary	A place where beehives are kept.
Acre	Measure of land. 4,840 square yards = .405 hectares. Originally the area of land that could be ploughed in a day by a team of oxen.
Agriculture	The cultivation of land and the production of fruit, vegetable seed, keeping of livestock, forest.
Apiculture	Beekeeping
Arable land	Land fit for tillage. Land ploughed or tilled at regular intervals.
Arid	Dry land. Often sparce of vegetation. Limited rainfall. Short grass - typically tree-less.
Barley	A cereal grain used for stock feed and beer making.
Bedding	Litter for farm animals to sleep on, usually straw or shavings.
Beef	Meat from a bull, cow or steer.
Billy Goat	Male goat.
Bran	The husks from ground grain. High in fibre content. Wheat bran is a by-product of flour milling.
Brand	A mark burned onto an animals' hide by means of a hot branding iron for purposes of identification.

Breaking - Ploughing uncultivated or new land. "Breaking sod"

Breed - A strain, race, variety or kind of plant or animal. Example, Holstein is a breed of dairy cattle.

Broiler - Chicken raised for the table under intensive conditions for 9 - 11 weeks. Weight 3.5 - 4 lb. (1.6 - 1.8 kg.)

Brooder - Unit containing a heat source where newly hatched chicks are kept.

Bushel - Measure of grain, containing 1.25 cu feet or 8 gallons. Many farmers still use this measure when relating to seeding or production.

Buttermilk - The liquid which remains when cream is churned to butter.

Calf - Baby cow or bull. Very young cattle.

Broiler

Cereals	- Cultivated members of the grass family whose seeds are edible. These can be used to provide flour for bread making or as animal feed. Examples: Wheat & rye, bread, barley, oats.
Cheese	- A nutritious food stuff. Prepared from the curd of milk coagulated by rennet or acid and separated from the whey and pressed into a solid mass.
Chick	- A newly hatched young bird.
Clone	- A group of plants or animals all having an identical genetical make up. Being the descendents of a single parent. Plants may be vegetatively raised by taking cuttings from a single parent plant.
Compost	- A material derived from decomposed plant remains. This is usually made by fermenting waste plant material in heaps, but with adequate aeration. Lime, nitrogen, and water may be added.
Conservation	- The protection of the soil against erosion or loss of fertility

Chick

Corral	- An enclosure in which cattle or horses are kept.
Cow	- The female of the bovine animals.
Dirty Land	- Usually refers to land infested with weeds.
Drill	- An implement used to place seed in rows.
Drone	- Male bee.
Embryo	- Young animal or plant in its earliest stages of development after fertilization. Example; young animal in its mother's womb or seed embryo. That portion of the seed which is capable of cell division.
Ewe	- An adult female sheep.
Fallow	- Land left idle or unsown for a season during which it is cultivated to kill perennial weeds. The practice of fallowing is no longer common in good moisture zones.
Feedlot	- A small area of land where animals are fed in large numbers. Feed is brought into the feed lot from other areas.
Fertilizer	- Anything added to the soil to increase the amount of plant nutrients available for plant growth. Includes: compost, manure, chemical.
Fleece	- Sheep's coat of wool.
Fodder	- Feed supplied to livestock such as hay and straw.

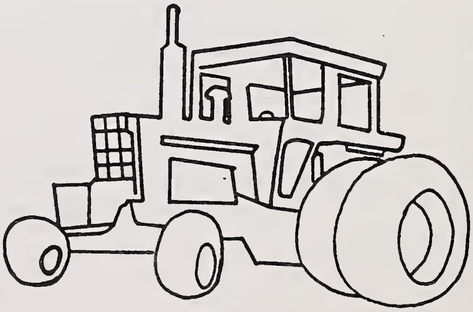
Germination	- The commencement of growth of a seed. Production of roots and shoots from the seed embryo.
Granary	- A farm building for storing grain.
Graze	- To eat or feed on growing grass and other pasture plants.
Harvest	- The time when ripe or mature crops are cut, lifted or picked and gathered.
Hay	- Grass or legume plants conserved in dry form for animal feed. (Contrast to silage, which contains high moisture.)
Hectare	- Metric unit of land measure = 10,000 square metres. 1 hectare = 2.47 acres.
Honey	- A thick sweet fluid prepared by worker bees from nectar collected from flowers.
Humus	- Decomposed and partly decomposed organic matter in the soil. Derived from plant and animal residue.
Irrigation	- The application of water to soil to provide an adequate supply for crop needs, to increase crop yields as to aid their establishment.
Lactation	- The period during which a female produces milk.
Lamb	- Young sheep.

Land Use	- The main uses of land including agriculture, woodland, industrial, residential, transportation corridors.
Livestock	- Domesticated animals such as cattle, horses, pigs, poultry, sheep, etc.
Manger	- A trough in which feed for cattle or horses is placed.
Market Garden	- Land used to grow vegetables and fruit for sale for direct human consumption.
Milk	- White liquid secreted by female mammals for nourishment of their young.
Milking Parlour	- A building containing specialized milking machines where dairy animals are milked. Cows are brought into the milking parlour for milking twice a day.
Mixed Farm	- A farm on which a range of activities including crop production and livestock keeping are practiced.
Oats	- A cereal crop. Grains are used for stock feeding or bread making and porridge.
Oilseed Crops	- Grown for the oil content of their seeds. Edible oil is used for the manufacture of margarine and cooking oil. The by-product called oil cake meal is rich in protein and used in animal feed.

Orchard	- An area of land used for growing fruit trees.
Ox	- Term used for cattle when used for draft purposes.
Parasite	- An organism which lives in or on another from which it derives food and shelter. Includes internal worms and external flies or mosquitoes.
Pasture	- An area of grassland used only for grazing.
Pesticides	- Poisonous chemicals used to kill pests such as fungus, plants, insects and rodents.
Photosynthesis	- Process by which green plants synthesize carbohydrates from water and carbon dioxide using the energy of sunlight absorbed by chlorophyll.
Piggery	- A place where pigs are kept.
Plough	- One of the oldest types of tillage implement which breaks up the land turning over the soil into ridges and furrows.
Polled	- A term used for animals which naturally lack horns; (polled hereford).
Poultry	- A term for domestic fowl kept for egg and/or meat production.
Reforestation	- Planting of trees on land where a forest has previously stood, but has been destroyed.

Root crop	- Plants grown for their edible swollen roots. Example: turnips, carrots and potatoes.
Ruminant	- An animal which chews the cud and possesses a complex digestive system.
Season	- One of the four climatic divisions of the year. Example: Spring.
Seed bed	- Land cultivated to a level fine tilth in which seeds are sown.
Shear	- To cut or clip a fleece from a sheep.
Silage	- A feeding stuff consisting of forage crops harvested in the green state and with sufficient moisture to ensure fermentation, in the absence of oxygen. The feed is partially fermented and stored in a silo.
Sire	- Male Parent of an animal.
Soil	- The unconsolidated (loose) material covering the surface of the earth in which plants grow and in which many organisms live.
Sow	- Adult female pig.
Spraying	- Application of pesticides, fertilizers or seed to crop land. - Ground spraying uses towed or self-propelled equipment. - Aerial spraying - uses an airplane or helicopter to dispence the product (granular or liquid form).

Stubble	- That part of a crop left on the ground after harvesting; includes roots and/or dry stalks.
Tillage	- The process of preparing the land for planting. Includes such operations as ploughing, cultivating, discing etc.
Tilth	- The condition of the top soil after tillage. A fine tilth consists of small clods.
Tractor	- A vehicle for pulling farm implements and trailers.
Veterinarian	- A person qualified in veterinary science - the study of animal diseases - who can diagnose diseases, prescribe medicines and perform surgery.
Wean	- To separate a young animal from its mother so that it no longer has access to its mother's milk and must rely on other foods.
Weeds	- Plants growing where they are not wanted.
Wheat	- Cereal grain used mainly for flour making. (for bread or pasta)


Tractor

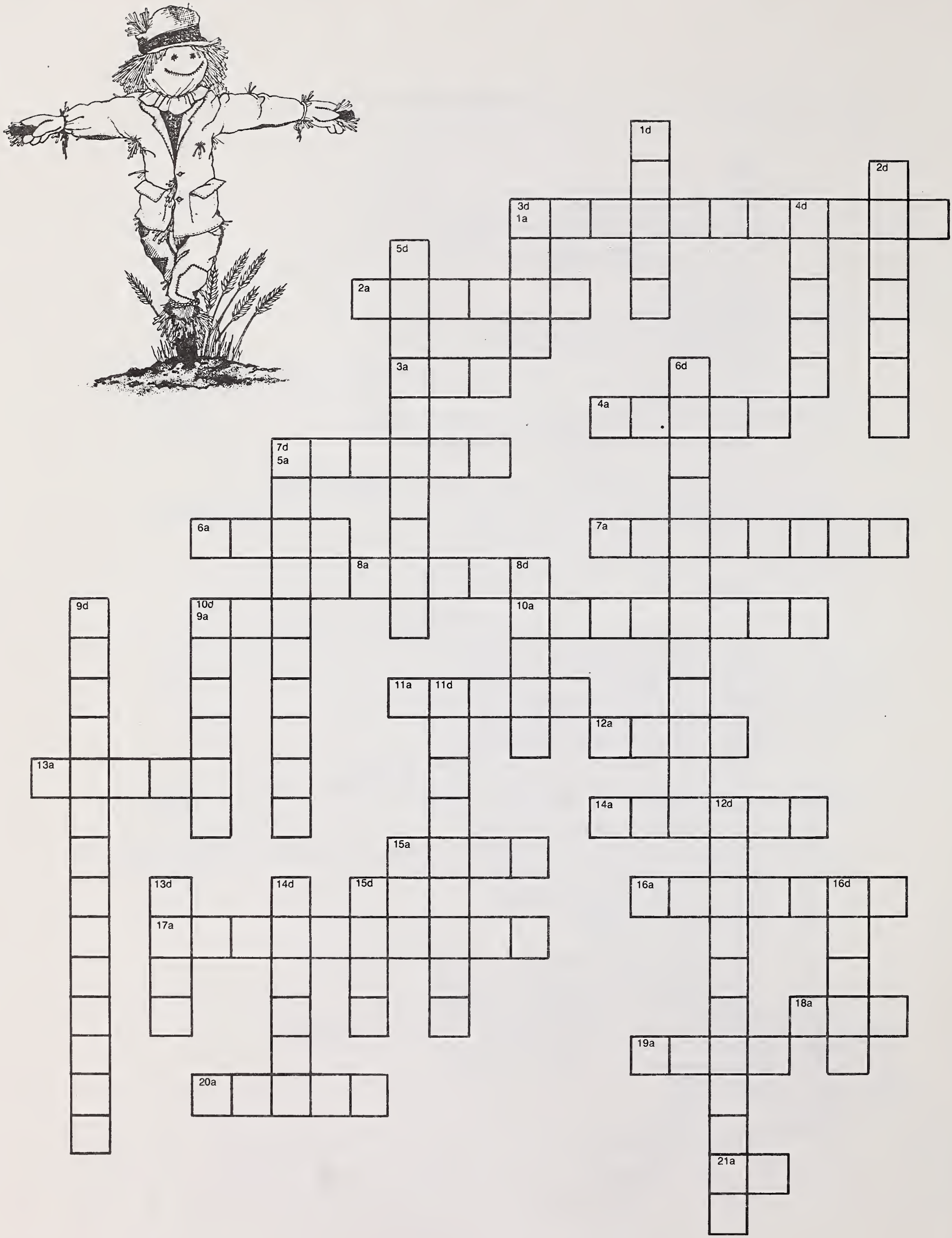
Crossword Puzzle Clues

DOWN

1. Newly hatched bird.
2. Farm vehicle used for pulling.
3. Measure of land area.
4. Condition of top soil.
5. Beekeeping.
6. Animal doctor.
7. By-product of making butter.
8. Male bee.
9. Plants manufacture food using this process.
10. Unborn animal.
11. Period of milk production of an animal.
12. Commencement of growth of a seed.
13. Father of an animal.
14. Partially fermented forage crops. Animal feed.
15. Young sheep.
16. To cut the wool from a sheep.

ACROSS

1. The cultivation of land and production of food.
2. Place where beehives are kept.
3. Female bovine.
4. Cereal used for making bread flour.
5. Cereal used in beer making.
6. Cereal often fed to horses.
7. Organism living in or on a host animal.
8. Identification mark burned into an animals' hide.
9. Female sheep.
10. Animal which chewes its cud.
11. A group of plants or animals having an identical genetic make up.
12. Plants grow in this material.
13. Sweet liquid made by bees.
14. Container for feed.
15. Baby cow or bull.
16. Time when ripe crops are cut and collected.
17. The application of water to soil.
18. Dried grass or legumes - animal food.
19. To remove the young animals from their mothers.
20. Plants that grow where they are not wanted.
21. Cattle used for draft purposes.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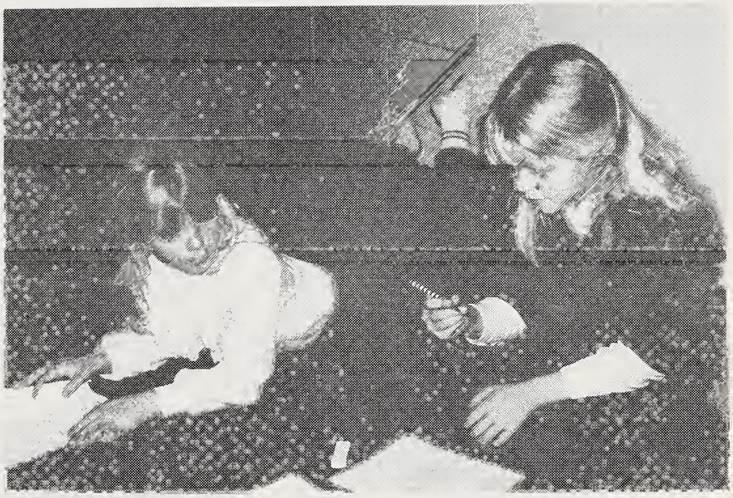
Students from
Joe Clark School

working together
to get it right.



Students proudly
demonstrate the
finished product.

1a AGRICULTURE
1d CHICK
2a APIARY
2d TRACTOR
3a COW
3d ACRE
4a WHEAT
4d TILTH
5a BARLEY
5d APICULTURE
6a OATS
6d VETERINARIAN
7a PARASITE
7d BUTTERMILK
8a BRAND
8d DRONE
9a EWE
9d PHOTOSYNTHESIS
10a RUMINANT
10d EMBRYO
11a CLONE
11d LACTATION
12a SOIL
12d GERMINATION
13a HONEY
13d SIRE
14a MANGER
14d SILAGE
15a CALF
15d LAMB
16a HARVEST
16d SHEAR
17a IRRIGATION
18a HAY
19a WEAN
20a WEEDS
21a OX

Lesson 10

POWER

Subject Area:	Science
Grade:	5 of 6
Curriculum Direction:	Matter and Energy Energy Resources and Conservation
Lesson Concept:	Energy has been necessary in the past, is necessary today and will be necessary in the future. Development of most industries has been strongly influenced by energy sources. The source of energy to accomplish our work is changing; is it renewable?
Purpose:	To compare power and fuels used in the development of the Agriculture industry in Alberta.
Materials Required:	Worksheets supplied in this lesson. Further Information - "Agriculture and the Provincial Economy".
Time Required:	1 Class period.

PROCEDURE:

Part 1

Introduction:

Agriculture is a very energy intensive industry. Because of the physical working of the land and the chores related to animal production or husbandry, farmers have sought more power and more sophisticated machines to assist them with farm labour. In this exercise students will be asked to evaluate some of the forms of power and the fuels they use as to their efficiency, ease of use, and renewability.

Part 2

Discovering power:

1. Begin by asking the class to define Power by answering some of the following questions:

   a) What makes power?
   b) What can it do for us?
   c) What are some capabilities of your own physical powers? (Walking, running)
   d) By using tools we can increase our personal power. Examples: rakes, hammers, etc.
   e) All power or energy requires fuel. What is our source of fuel?
   f) Various foods have different amounts of energy content. What is a high energy food? (Sugar) Does sugar supply all of our needs? Why not?
   g) We eat food to supply our bodies with fuel. This gives us power. Can you think of any other sources of Power, that humans use, that they grow food for? (Animals - feed, steam - wood)

Renewable or non-renewable Fuels

The fuel that we grow is renewable. Some of the fuel used to produce the power to grow that fuel is not renewable. Today we require more and more power to do the work. Industries used to depend largely on human labour or power. They are now dependent on high energy power such as gas and oil.

In this exercise we will look at the various sources of farm power that have been used in Alberta in the last 100 years.

ACTIVITY #1:

Making Comparisons:

First look at the flow chart that illustrates Butter Making. (1900 - 1985). "Butter Production Process 1900 or 1985".

The processes in butter production are identified by numbered boxes. Notice that the processes are identical. However the power and fuels used to do the work are very different.

On the work sheet, try to fill in the power and fuel sources for each of the processes used in butter production in 1900 and 1985.

Note: Identify the fuel used to generate the powers - not to produce the milk. See the example on the work sheet.

ACTIVITY #2

Gathering Information:

Have the students study the historical pictures provided with this lesson. They depict various sources of farm power which have been used on Alberta farms in the past.

Ask the students to do the following tasks:

1. Identify the source of power for each illustration. (Fuel)
2 Describe the activity shown.
3. Decide if the fuel required in each case is a renewable resource.
4. Choose which of these power sources are the most efficient and which are the least efficient.

FARM POWER COMPARED

Power	Fuel or Source	Renewable Fuel	Type of Energy Generated
Human	Food (meat, vegetables)	Yes	Very low, power inefficient
Draft Animal	Hay, Grain	Yes	Low power - slow
Steam	Coal, Wood, Gas, Oil	Partly	Stationary or slow moving - powerful
Electrical	Wind, water, coal, gas, oil	Partly	Requires generators or electrical hook ups - good stationary power
Internal Combustion Engine	Gas, oil	No	High energy - very mobile

Conclusion:

With the class, show the steps of the production and processing of their breakfast cereal.

This can be a quick flow chart on the black board. Have them identify the areas where power is required and ask them to suggest what fuels are used.

For Discussion:

1. From a conservation point of view, which of the power sources discussed in this lesson would be best?
2. Why don't we use the power sources that are totally renewable?
3. Take a look at the following chart of Power used on farms. Notice the various fuel sources and pay particular attention to whether the fuel is a renewable resource or not. How much energy is generated?

Related Activities:

Make a collage of pictures of farm activities using various forms of power.

BUTTER PRODUCTION COMPARED

BUTTER PRODUCTION 1900

	POWER SOURCE	FUEL REQUIRED
1. Feed the cow	- human labour	- human food
2. Milk the cow		
3. Separate the milk		
4. Churn the cream		
5. Wash the butter		
6. Mold and Pack the butter		

BUTTER PRODUCTION 1985

	POWER SOURCE	FUEL REQUIRED
1. Feed the cow	- machine labour	- fossil fuel (gas, oil)
2. Milk the cow		
3. Separate the milk		
4. Churn the cream		
5. Wash the butter		
6. Mold and Pack the butter		

BUTTER PRODUCTION PROCESS 1900 or 1985

1. FEED THE COW

- cow produces milk -

2. MILK THE COW

- whole milk -

3. SEPARATE THE MILK

- skim milk - cream -

4. CHURN THE CREAM

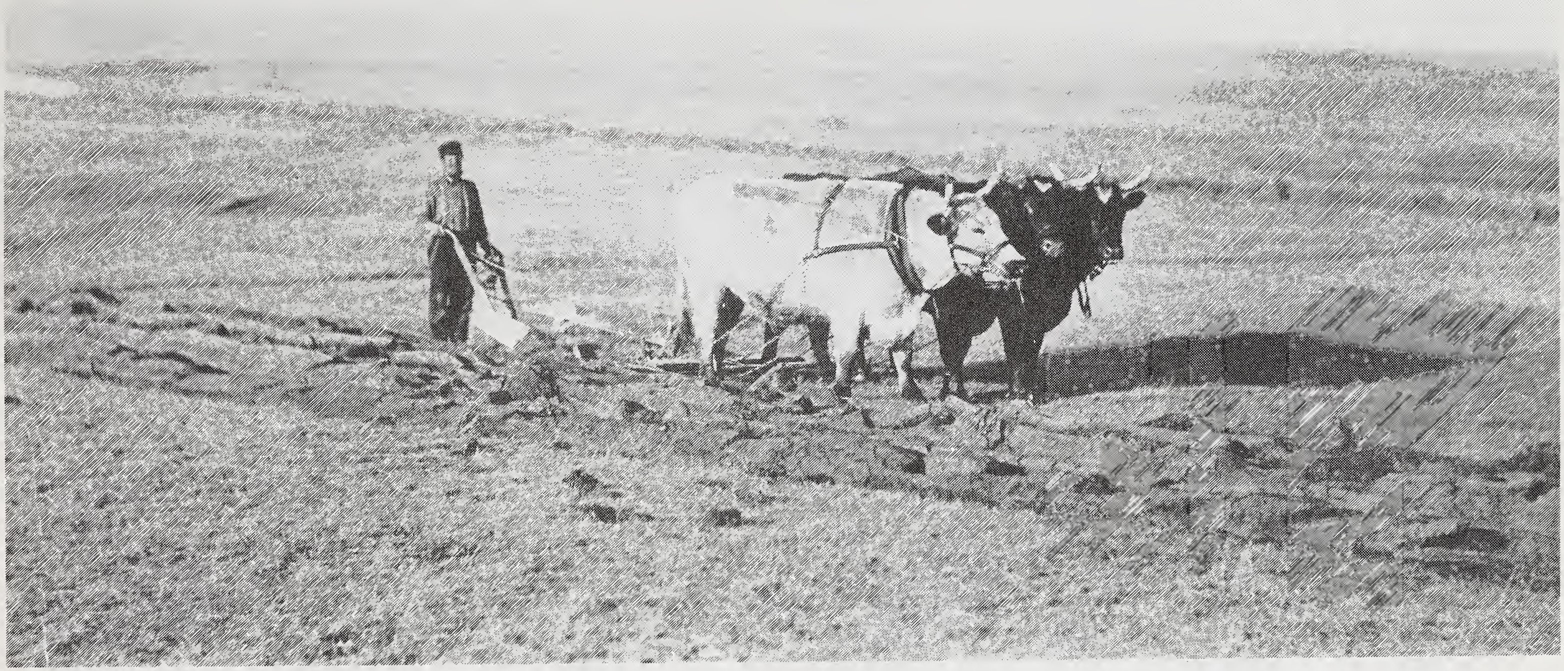
- butter milk - - butter -

5. WASH THE BUTTER

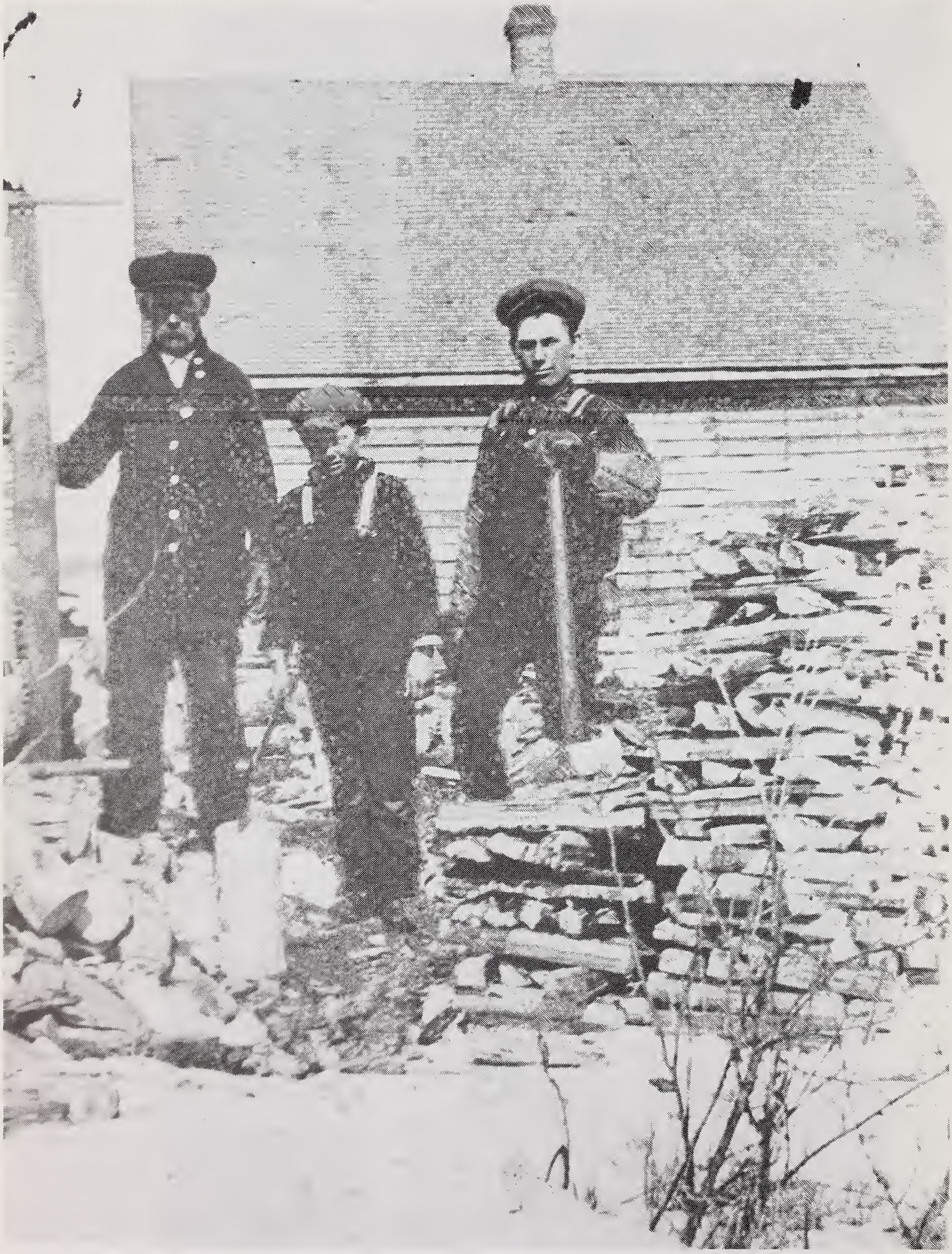
6. MOLD AND PACK BUTTER

- Butter ready for use -

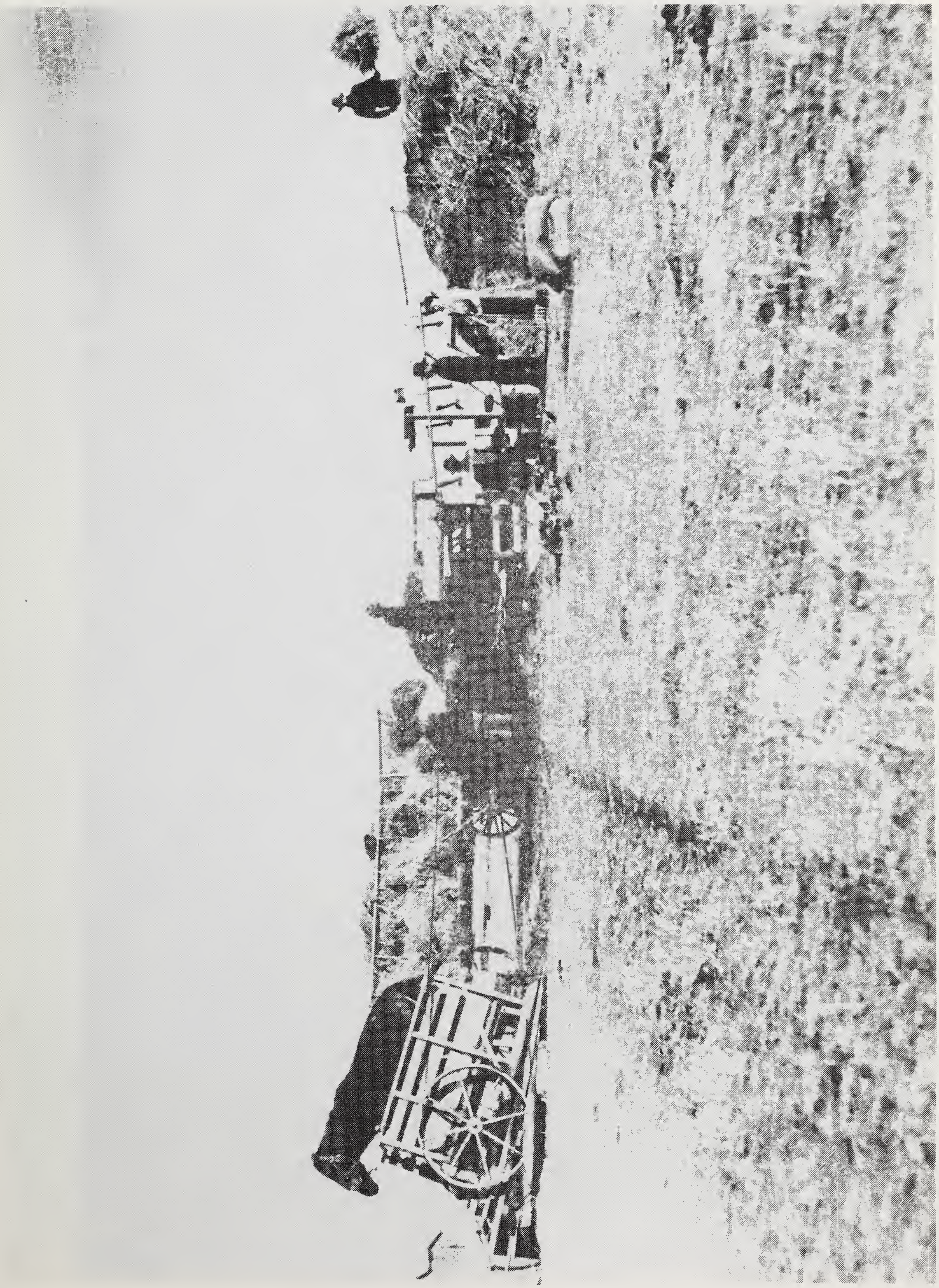
Make Mine Milk!



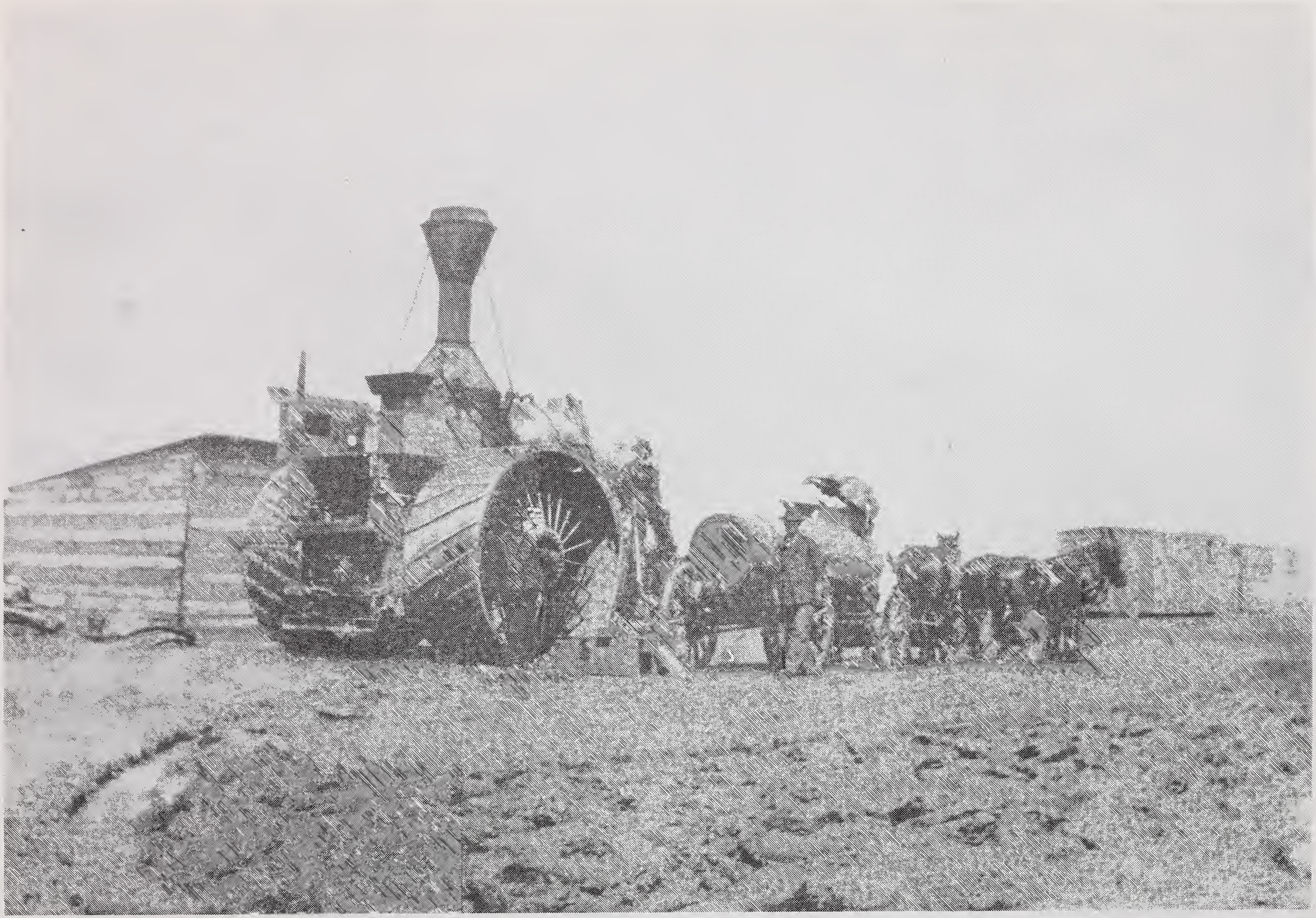
3. PLOUGHING



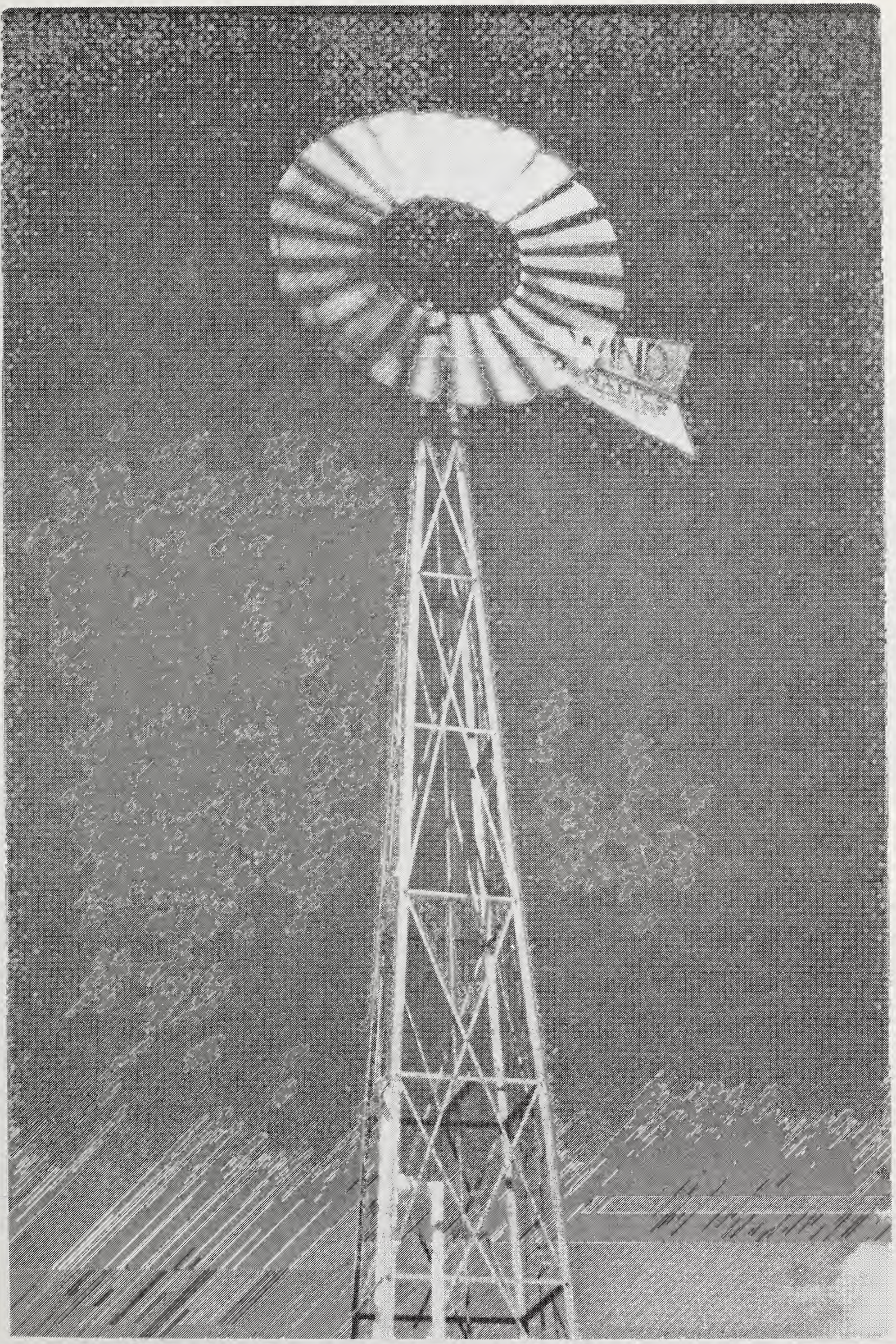
4. CHOPPING WOOD



5. THRESHING GRAIN



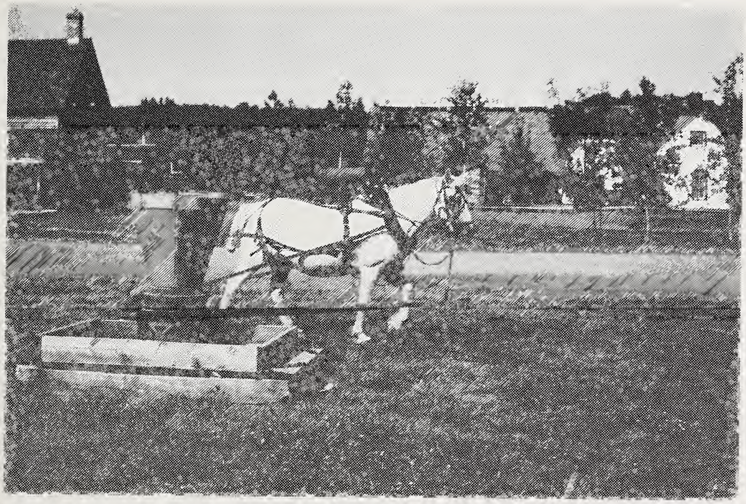
6. STEAM ENGINE

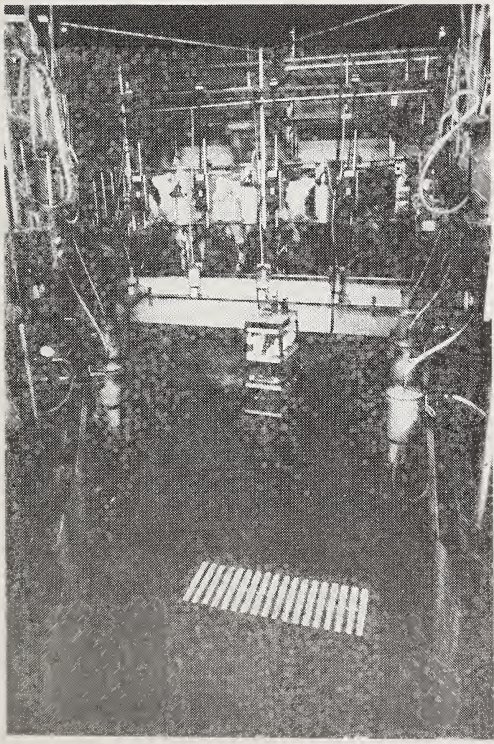


7. WINDMILL

- Electricity

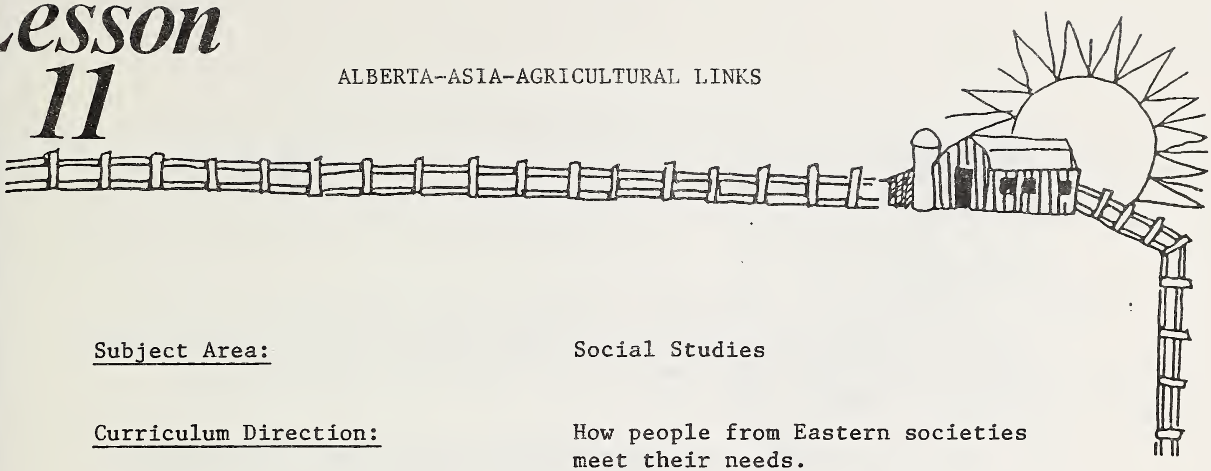
- Fossil Fuels





Lesson 11

ALBERTA-ASIA-AGRICULTURAL LINKS



Subject Area:	Social Studies
Curriculum Direction:	How people from Eastern societies meet their needs.
Major Concepts:	- Customs and Traditions - Cross cultural sharing - International agencies
Lesson Concept:	Some Eastern societies look to Western products and technology to provide solutions to their problems.
Purpose:	- To introduce students to a twinning program between Alberta and Asian Provinces which focuses on an Agricultural exchange as a major part of the activities. - Students will have an opportunity to practice their research skills. - To improve listening skills.
Materials Required:	Worksheets supplied in this lesson Map of the world. Further Information - "Net Value of Product", "Agriculture and the Provincial Economy"
Time Required:	3 Class Periods

PROCEDURE:

Part 1

Introduction:

The twinning of Alberta with three Asian provinces has led to a variety of exchanges. The focus of this lesson is on the agricultural similarities which have resulted in a sharing of technology and resources from this industry.

1. In a discussion, have the students review some of the physical features of Alberta. Where is it located relative to the north pole? Discuss our weather patterns. On a map, point out the location of our twin Asian provinces.
   - Review some of the physical and climatic conditions found in these areas. (See the resource materials.)
   - Based on the conditions, ask the students to suggest what Agricultural Products these Provinces may produce
2. Review the introduction to the Asia-Alberta Exchange. Resource page 1 and 2.

Part 2

Listening:

1. Divide the class into 3 groups.
   Group one will research the Japan twinning project.
   Group two will research the Korea twinning project.
   Group three will research the China twinning project.
2. Review the "Information Outline" worksheet with the class and give each of the groups one copy of the worksheet for each child.
3. Give each group two or three copies of the resource material on their province.

Part 3

Research:

4. Have the students research the information required on the outline and complete the worksheet.
5. Each group should compile their findings and make one good copy of their outline for presentation to the class.

Conclusion:

1. Each group will present their findings to the class.
2. The audience should be provided with blank "Information Outlines".
3. Have the audience take notes from the presentations from other groups.
4. Have a question period at the end of each presentation so that facts can be clarified.

For Discussion:

1. If a herd of cattle was exported from Alberta to Asia, how would their new environment compare with Alberta?
2. Why is this such a valuable program to the Asian communities?
3. What might Alberta be able to learn from these people?

Related Activities:

1. Contact some of the schools in Alberta that have twin schools in Asia and see about contributing information to their communication packages.

2. Subscribe to the Asia-Alberta Exchange news letters and information.

3. Using the material provided in this package, students could construct an Agricultural Products chart to compare Alberta to her sister provinces.

4. Review the resource "New areas of Agricultural Co-operation Explored" and make a list of exchange activities related to Agriculture.

5. Using the information given in the resource "Alberta Gives Tips on Farm Management", do the supplementary lesson provided.

Supplementary Lesson

To the Teacher:

This lesson is recommended for students who are familiar with beef production or for enrichment purposes.

Introduction:

Highlight the information on the Farm Demonstration Project. Since much of the area in this province is unsuitable for cultivation, the land is better used to provide forage for cattle and thus produce food for the citizens. In order to get maximum benefit from this operation, the best livestock and the best forage should be used. This country looks to Alberta for assistance in development in both of these areas.

The Activity:

Ask the students to imagine that they are owners of a large cattle ranch here in Alberta. They have been approached to supply some stock to the Demonstration Farm in Asia. They will be sending some of their best animals.

As a class, or in groups, have the students prepare instructions for the care and feeding of these very valuable animals.

Description of the Animals Selected for Export

Animal Number	Breed	Age	Sex
1	Angus	2 years	Female
2	Angus	1 year	Male
3	Hereford	2 years	Female
4	Hereford	2 years	Female
5	Semmital	2 years	Male
6	Charolais	2 years	Male
7	Charolais	1 year	Female
8	Hereford	1 year	Male

These animals will be used to improve the beef quality of the native cattle. It is essential that they be maintained in excellent condition so that they will be able to be as productive as possible.

Good care of these animals should include:

- Feed
- Preventative Medicine
- Handling
- Accommodation

You may choose to assign a group of students to prepare the directions for each of these aspects of care.

Conclusion:

When the students have prepared their care directions, have them find pictures which may help to illustrate their recommendations. If the activity has been done in groups, have each group present their directions to the class. If the activity has been done by the whole class, they could create a display of the material and illustrations on a bulletin board in the classroom.

Worksheet

INFORMATION OUTLINE

1. Country ______________________

2. Province ______________________

3. General location and climate:

4. Agricultural Products:

5. Trade with Alberta - Asian Products

- Alberta Products

4. Write a short description of the Asian province.

The following information is quoted from the Asia-Alberta Exchange. The newsletter of Alberta's activities with Asia and from the Overview reports from the exchange.

Introduction:

THE ASIA-ALBERTA EXCHANGE

The relationships which Alberta has established with the provinces of Hokkaido in Japan, Heilongjiang in China, and Gangweon* in Korea are indeed special. They are not associations in name only, but rather involve a great many reciprocal activities and programs in a variety of areas. Ours is the only Canadian province to date to engage in international affiliations of this nature.

Why does Alberta have this kind of relationship with three provinces in Asia? These special relationships develop mutual trust and understanding between the partners, vital elements in any dealings with Japan, China, and Korea. The relationships are highly regarded and deemed to be important by both Alberta and the Asian provinces and by the respective central governments as well. Alberta is accorded a great deal of recognition for its role in these affiliations.

Perhaps the strongest link between Alberta and each of the three Asian provinces is that they are all located in northern regions. They are all winter provinces, with similarities in climate, geography, and resources - providing common ground for co-operation in resource development, agriculture, forestry, technology, trade, culture, education and sports. Through the years, between 80 and 90 per cent of the exchange activities relate, directly or indirectly, to adaptations we must make because of our shared northern concerns.

Together, through these special relationships, we have built an effective cultural bridge for continued co-operation and exchange. The partners have developed and expanded shared interests in economic, technological and many other spheres. Alberta considers Japan, China and Korea to be important trading partners, and these special relationships have enhanced opportunities and provided mutual benefits.

Each of the special relationships has been formally established: Alberta and Gangweon signed a reciprocal agreement in 1974; Alberta and Hokkaido signed a Proclamation of Friendship and Affiliation in 1980; and Alberta and Heilongjiang signed a Protocol of Understanding and Friendship in 1981. Sub-agreements have been signed in sports, trade, medicine, agriculture, and petroleum technology; and official government delegations have exchanged numerous visits. As well, universities in the Asian provinces have established affiliations with universities in Alberta; and primary and secondary schools have formalized "twinning" relationships with similar schools in our sister provinces.

Managed and coordinated by the Alberta Government Committee on Special Relationships, with representation from several departments, these affiliations have touched many people. They are a unique source of trust and mutual understanding across international boundaries.

*Editor's Note: The name Gangweon has since been changed to Kangwon and the new name is used in some of the texts in these articles.

JAPAN

AN OVERVIEW OF THE SPECIAL RELATIONSHIP BETWEEN ALBERTA AND HOKKAIDO

Hokkaido, the northernmost of Japan's four major islands, has much in common with Alberta. Both are located in northern regions, have agriculture-based economies, and share similar climates and topography. Hokkaido has rich agricultural resources (its main products are rice, wheat, beans and potatoes) and a large dairy and livestock industry.

There is also a continued strong potential for sales in other breeds of cattle and additional feed and forage seed. There is also potential for consulting services and pasture management and for food processing, livestock production and forage seed development. Recently, Hokkaido officials have agreed to give active consideration to Alberta's participation in a major (10,000 hectare) beef development project. As well, there have been modest sales of peat moss, whiskey, honey and cheese. Alberta Agriculture is involved in further food promotion at the Alberta Food Show held in Hokkaido in September 1985. A notable result of the Alberta-Hokkaido affiliation in the commercial area was the purchase this year by the Hokkaido Takushoku Bank of a ten percent interest in the Bank of Alberta, in a deal worth $3.94 million. Ongoing sales of log homes to Hokkaido by WPM Handcrafted Log Homes Ltd., a local Spruce Grove manufacturer, are another feature of the commercial interaction between the provinces.

ISLAND OF HOKKAIDO
JAPAN'S SECOND LARGEST

Hokkaido is rich in agricultural resources - a major producer of dairy products, sugar beets, wheat, beans, and livestock. Fishing is also a major industry, with the 2700-kilometre coast yielding abundant hauls of herring, salmon, and kelp.

AGRICULTURE

Alberta and Hokkaido have developed strong links in agriculture, both in terms of the continuing agricultural exchange program and successful trade ventures. Each year, Alberta sells about 300 head of Angus beef cattle, 8,000 tonnes of animal feed (mostly dehydrated alfalfa), and 300 tonnes of forage seed to Hokkaido. In addition, Alberta peat moss, whiskey, and honey register modest sales in the sister Japanese province.

Alberta Agriculture has introduced five varieties of Alberta cheese into the Japanese market. Although even in Hokkaido, the dairy capital of Japan, cheese is comparatively new to people's diet, sales have been steadily increasing. Jackson Gardner, international trade director, Alberta Agriculture, says that cheese is continuing to do well. "In fact, we are sending a mission of cheese producers to Hokkaido this autumn," he adds.

Mr. Gardner says that diversification in agriculture in Hokkaido has presented new opportunities for cooperation between the sister provinces. Hokkaido has embarked on a major (10,000 hectare) beef development project, and Mr. Gardner says that Alberta may be involved in technical assistance.

These are indications that Alberta may be able to provide other breeds of cattle, additional feed and forage seed, and consulting services in livestock and pasture management. Potential is good for joint ventures in Hokkaido in food processing, livestock production, and forage seed development. This summer, Alberta hosted several agriculture missions from Hokkaido, including dehydrated alfalfa research specialists.

Agriculture will continue to be important in the further development of the special relationship between Alberta and Hokkaido.

KOREA

ALBERTA-KANGWON OVERVIEW

Alberta and Kangwon became sister provinces on September 3, 1974 during a visit by the Honourable Hugh Horner. Little activity took place until 1979, when agricultural co-operation was initiated. Recently, there has been increasing activity in the areas of education and sports.

Kangwon is a region of dramatic natural beauty - an area of 16,893 sq km, it has a population of 2 million people and is a popular, year-round resort, attracting thousands of tourists to its rugged mountains and long stretches of scenic beaches. The clear icy waters of mountain streams, beautiful lakes, hot springs, and deep underground limestone caves bring many visitors for hiking, mountain climbing and skiing to the area; while the shallow waters and gentle currents of the coastal area on the Sea of Japan invite them for summer recreation. Kangwon is also rich in traditional culture and history, and the area is studded with temples and ancient pagodas.

An economy based on agriculture makes Kangwon an ideal partner for Alberta. The major crop is rice, but Kangwon ranks first in South Korea in the production of potatoes and corn. Farmers also harvest barley, wheat, tobacco, and market vegetables such as radishes, cabbages and the red peppers so central to their cooking. In addition, Kangwon is an important supplier of alpine vegetables to the other provinces.

The highland regions offer fine pasture for beef and dairy herds. Throughout the past 10 years, with the imports of Alberta breeding stock and the technical consulting services of livestock and pasture management experts from our province, there has been considerable development and improvement in this area.

Agricultural co-operation began with a farm demonstration project, which was officially opened by the Honourable Dallas Schmidt in October 1979. Initially Alberta Agriculture and the Cattle Breeders Association jointly donated 33 heads of Brown Swiss, Limousin, Charolais, Herefords and Angus, to be placed on a demonstration farm and crossbred with Korean cattle to demonstrate improved characteristics. Alberta has also sent an animal expert (Terry Lee) to visit and lecture on how to improve the forage and livestock industries. The Honourable James D. Horsman visited the farm during his visit to Kangwon in December 1983.

Agriculture is also the focus of Alberta's commercial interests in Kangwon. In the past, Kangwon has bought beef cattle from Alberta at the rate of 4,000 head per year and has expressed interest in other breeds of cattle (Charolais). We are also selling modest amounts of hides, grains (rye, oats), animal feeds (including canola meal, grain screening pellets), and are involved in providing consulting services (in livestock and pasture management). There are good indications that canola meal sales will increase significantly and important potential exists for significant sales of Alberta dehy alfalfa, forage seeds, barley, swine, breeding stock, and additional consulting services in livestock and pasture management. There is also potential for technical cooperation and consulting services in forestry management and for the sale of root trainers. The Alberta-Kangwon farm demonstration project will continue to present growing commercial opportunities in the area of livestock production. The Horourable LeRoy Fjordbotten visited Kangwon in June 1984 to examine these areas of cooperation.

SHARED INTEREST IN AGRICULTURE

From the very beginning, Alberta and Kangwon have recognized their shared interests in agriculture. The sister relationship has focused on those interests and through the years, the resulting trade and consultations have been productive.

The Honourable LeRoy Fjordbotten, Alberta's minister of Agriculture, visited Kangwon this spring to reinforce existing trade markets and to examine new opportunities for co-operation. Discussions with both central and provincial government officials were promising. "Everyone I met with was impressed with Alberta's performance as a long-term, consistent supplier of high quality products," Mr. Fjordbotten said. "There is great potential for increasing our share of the Korean markets."

The minister discussed the possibility of increasing the imports of Alberta beef cattle to Korea. Present sales stand at about 4,000 head of beef cattle each year to Kangwon and those sales are important for the whole Korean market. The breed which has been most successful for the Kangwon farmers has been Alberta Simmental, and the farmers have indicated their preferences to the central government. According to Alberta Agriculture information, 60 percent of all cattle imported by Korea are now Simmental and that augers well for Alberta producers.

The other major area of trade has been grain. Jackson Gardner, International Trade Director, Alberta Agriculture, indicates that sales to Korea have been strong: "Last year, there were $40 million of grain sales between Canada and Korea, with about 40 percent of those sales from Alberta". Direct sales to Kangwon have included rye and oats, as well as animal feeds such as canola meal. Future trade will likely include dehy alfalfa, forage seeds, and barley.

Alberta has also sold Kangwon modest amounts of hides; and through the years, has provided considerable consulting services in livestock and pasture management. The Farm Demonstration Project (outlined in the June '84 issue of this newsletter) , combining both sales of Alberta breeding stock and the consultation services of Alberta experts, clearly showed the mutual benefits in agriculture for the sister provinces.

In the future, there is potential for even greater technical co-operation and consultation support in forest management and soil studies. Further educational and technical exchanges are also being encouraged. As predicted, the long-standing shared interests in agriculture have enriched Alberta's sister relationship with Kangwon.

CHINA

AN OVERVIEW OF ALBERTA-HEILONGJIANG RELATIONS

Heilongjiang has an extensive agricultural base. It is a major grain producer and is expected to play a vital role in China's livestock development during the coming years, given the special emphasis the Chinese Government has placed on agricultural modernization. The climate and topography of Heilongjiang are similar to those of Alberta, with a frost-free season averaging 120 days.

Alberta has an agricultural cooperation agreement with Heilongjiang, stressing the areas of animal husbandry, pasture management, genetic technology and food processing. There have been a number of commercial spinoffs from this co-operation. In 1982 Heilongjiang purchased 100,000 hides, valued at approximately $5 million, from Alberta, and these sales have been of a continuing nature to the present. Since 1982 Alberta has been selling Heilongjiang some 25,000-30,000 tons of malting barley per year and these sales are expected to continue. Discussions have been carried out on a possible agreement for the sale of 200-500 head of dairy cattle (Holstein) per year. As a result, of the signing of an animal health agreement between the two provinces, these and other sales are expected to materialize in the near future. There exists strong potential for the sale of beef cattle, forage seed and animal feed (pre-mixes), as well as for consulting services in the area of livestock management. Further commercial opportunities are likely to arise from our agricultural co-operation program.

AGRICULTURE - "AREA OF GREATEST INTEREST FOR BOTH PROVINCES"

Agriculture is a major factor in trade relations between Canada and the People's Republic of China: Canadian wheat exports to China are currently valued at more than $700 million a year. Of that wheat, an estimated 60 per cent is grown in Alberta, placing China as Alberta's most important agricultural market.

Since the signing of the Protocol of Understanding and Friendship by Heilongjiang and Alberta in September 1981, agriculture has become a major area of mutual interest and cooperation between the two provinces.

Early in 1982, agricultural experts from Heilongjiang and Alberta exchanged visits to discuss the potential for cooperation in trade, seed exchange, and animal husbandry. At the same time, arrangements were made to export brine cured hides and malting barley from Alberta to Heilongjiang.

These visits showed that the geographic and climatic similarities of the two provinces provided a natural base for the development of the special relationship envisaged in the September 1981 protocol. Both are northern provinces, with long, hard winters and relatively short growing seasons; both have vast expanses of rangeland for cattle grazing; both have extensive crop-growing areas. Both, to a considerable degree, face the same problems in seeking to improve agricultural and livestock production.

The prospects for mutual benefit in an exchange of information and technology were apparent. The adaptation of certain Alberta methods and techniques to Heilongjiang could help improve that province's productivity; the work undertaken in Heilongjiang on plant and animal genetics is potentially useful in Alberta.

In October 1982, the departments of agriculture of the two provinces signed a sub-agreement to the September 1981 protocol. They agreed to emphasize trade and the exchange of technology in agriculture and animal husbandry. Activities highlighted in the sub-agreement included potato production and pasture management; technological exchange to improve the cultivation of grain, oilseeds and vegetable seeds; and co-operation in the breeding of beef cattle, dairy cattle, and swine.

The sub-agreement also called for trade and the exchange of technology in the processing, packaging and distribution of meat and meat products, milk, hides and leather, beer, and potatoes.

In September 1983, during a visit to Heilongjiang, the Hon. Peter Lougheed, the Premier of Alberta, reconfirmed that "agriculture remains the area of greatest interest for both provinces, and has been the one area so far which has given Alberta identifiable trade benefits".

It was also during this visit that the Premier and Chen Leo, Governor of Heilongjiang, listed these areas where future joint activity offers good prospects of mutual benefit:

- Continuation of the crop seeds exchange;
- Exchange of technology in the breeding of beef cattle, dairy cattle, and swine;
- Exchange of experts to promote mutual understanding of agricultural marketing structures and pricing;
- Continued trade in cattle hides and malting barley from Alberta; and
- Efforts to speed up the signing of an animal health agreement between China and Canada.

Once the technical problems related to the signing of such an animal health agreement are resolved, significant commercial sales of livestock to Heilongjiang may develop.

HEILONGJIANG AND ALBERTA:
THE SIMILARITIES

The two have a great deal in common: climate, resource development, agriculture, and perhaps most significantly of all - the need to find ways of dealing with winter, in sports and recreation, as well as developing production techniques for industry and agriculture.

Many Albertans may not be familiar with Heilongjiang. Here is an introduction to our "sister" province.

Heilongjiang is the most northerly of the 21 provinces in the People's Republic of China, located in the far northeast of the country, sharing a border of approximately 1900 kilometres with the Soviet Union. While the area of this province, the sixth largest in China, is almost a third smaller than Alberta's, the population of Heilongjiang (about 34 million people) is more than 15 times greater. Heilongjiang is China's principal oil-producing province, responsible for approximately 50 per cent of that country's petroleum output. As well, it has an extensive agricultural base. It is a major grain producer (known as the grain centre of China), and grows 70 percent of China's sugarbeet crop, in addition to significant amounts of soybeans, potatoes, sunflower seeds, corn, millet, flax and tobacco. It is also expected to play a vital role in the livestock development program which is part of the Chinese government's emphasis on agricultural modernization. The relationship with our province; involving co-operation and information, is of great benefit to both provinces due to the difficulties they both encounter resulting from extreme cold and a frost-free season averaging only 120 days.

Both provinces have rolling plains and grasslands, extensive tracts of good arable land and vast forested mountains. Like Alberta, Heilongjiang has many thousand square kilometres in the north still to be reclaimed for agriculture.

The mountain regions of Heilongjiang yield almost 40 per cent of China's dressed lumber and support a major paper-making industry. As well, the province has large coal deposits.

The major cities in Heilongjiang are Harbin, the provincial capital, with a population of more than 2 million, and Jia-mu-si, Mu-dan-jiang, Qi-qi-ha-er, and Daqing, all industrial centres.

More than 300 scientific and research institutions play an important role in the province's development. Many of these institutions are attached to factories; others have done significant research in agriculture and mechanical engineering.

There are approximately five million students in elementary and middle schools in Heilongjiang. In Harbin alone, there are almost 30 universities and comparable institutions.

NEW AREAS OF AGRICULTURAL COOPERATION EXPLORED

As shared interests in agriculture are revealed through the development of the special relationships, new areas of cooperation are constantly being explored between Alberta and various regions in Asia.

A recent trip to China, Hong Kong, Jakarta, and Bangkok by Alberta Agriculture Director Bill Anderson highlights some of the many ways activities are initiated and extended.

Last spring, LeRoy Fjordbotten, minister of Alberta Agriculture received a number of requests during his trip to Heilongjiang regarding co-operation in the area of food processing. In reponse, Dr. Bill Ballantyne, head of the department's agriculture processing development branch, accompanied Mr. Anderson to China.

"As a technical specialist, Dr. Ballantyne could assess the overall food processing capability in Heilongjiang by touring their facilities," Mr. Anderson explains. A report is being prepared on their findings.

In addition, Mr. Anderson reported on the progress of the QiQiHarr Range Improvement Project, a joint range management research project with Alberta.

"The experiments conducted in 1984 were very successful. The Canadian forage seeds are growing well. Heilongjiang expressed interest in expanding the project and we will discuss the matter during our next annual visit to China."

In October, the 17th agricultural delegation to come from Heilongjiang visited Alberta dairy and beef cattle operations, poultry farms, and meat processing and slaughtering plants. As well, the six member group looked at the treating and marketing of forage seeds, and toured the Leduc swine breeding centre. They also were interested in learning how information on agricultural technology is disseminated in our province.

There is a continuing exchange of people and information between the provinces concerning agriculture, and Mr. Anderson expresses the satisfaction of Alberta Agriculture with the relationship.

"We regard this as an interesting market. We are achieving a great deal in understanding the needs, constraints, and opportunities for mutually beneficial agricultural activities with China. It is a very active relationship."

Mr. Anderson's trip to Hong Kong. Jakarta and Bangkok demonstrates the expansion of Alberta's activities into other regions of Asia.

"In most of the countries of Southeast Asia, there are large and sophisticated hog and poultry operations. They are dependent on imported soybean meal as a protein supplement for feed. In November, a western Canadian canola mission travelled to Southeast Asia and I went earlier to get a feel for the market there," he explains.

He sees potential. "The market looks good. There was an enthusiastic response to the introduction of canola as a substitute or complement to soy meal for the hog and poultry operations."

This response could mean considerable trade. According to Mr. Andersons's information, one operation in Thailand imported more than 100,000 tonnes of soy meal last year. At $200 per tonne, that is a $20 million sale to just one user. Mr. Anderson suggests that benefits Alberta producers, "They could repeat the successes they have already achieved in Korea."

ALBERTA GIVES TIPS ON FARM MANAGEMENT

From the beginning of their sister relationship, Alberta and Kangwon have recognized the importance of their shared interests in agriculture. The Farm Demonstration Project is a major and longstanding program in the continuing affiliation between the provinces.

The project began in 1979, when Alberta Agriculture and the Cattle Breeders Association donated 18 head of purebred beef cattle to be crossbred with Korean native cattle on a demonstration farm near Chuncheon. According to David Clarke, International Trade Director, Alberta Agriculture, the project was designed to demonstrate the fine characteristics of Alberta beef cattle and increase the meat yeild of the Korean stock. The official opening ceremonies were held in October 1979, with the Hon. Dallas Schmidt, minister of Agriculture, representing Alberta. In 1983, the Hon. James D. Horsman, minister of Federal and Intergovernmental Affairs visited the farm during his trip to Gangweon.

Besides the five heifers and one bull each of the Hereford, Simmental and Angus breeds that were sent to Korea, forage crop seed also was donated to the project. Terry Lee, an Alberta livestock specialist, has visited the farm annually to introduce Canadian livestock management techniques (hoof trimming, innoculation) and provided the Korean farmers with information and guidance on improvement of forage and livestock production.

The Farm Demonstration Project has been deemed a success by everyone concerned. David Clarke expresses the satisfaction of Alberta Agriculture, "We are very pleased with the results. It was an excellent way to help the Korean farmers assess and upgrade their native cattle, and it has certainly been a clear demonstration of the high quality of Alberta stock.

The sister relationship between the provinces has been strengthened by the demonstration project and agriculture has continued to be an area of major activity. In 1981, the government of Kangweon wanted to undertake a land utilization assessment and because of the success of the earlier project in highlighting Albertans' expertise, they commissioned a study of an Alberta agricultural consulting firm, Deloitte Haskins and Sells Associates.

Mutual concerns in agriculture also have been important in the developing relationship between Kangwon National University and the University of Alberta, officially twinned in 1982. Since that time, discussions and activities have included a visit to Korea by professor Joesph Richter, department of agricultural economics. There have also been visits by professor Ron Micetich, department of pharmacy; professor Walter Wiorth, faculty of education; professor C.Y. Oh, education; Dean R. Patterson, education. In a future issue of Asia-Alberta Exchange, we will have a story about Dr. Richter's trip to Kangweon and Hokkaido.

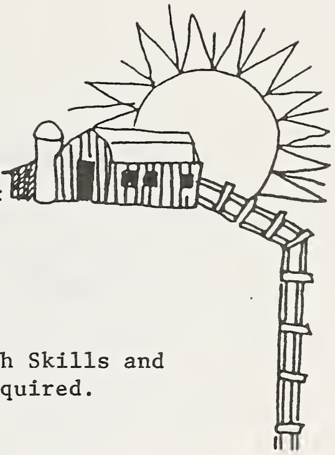
"Hello Alberta"
This hog lives in the research station in Gangweon.

A delegation from Asia visits Olds Agricultural College

Mr. Anderson from
Alberta Agriculture
visits a co-operation
project in China.

Lesson 12

WEATHER OR NOT



Subject Area:	Science Long multiplication Math Skills and Language Arts Skills required.
Curriculum Direction:	Earth, Space and Time. Weather functions. Measuring and predicting weather conditions which influence our lives.
Lesson Concept:	The Agricultural industry has been developed to take advantage of predictable weather patterns which occur in specific areas. These weather patterns are variable enough to be a major factor in yields and quality of agricultural products.
Purpose:	To illustrate the influences, both positive and negative, of seasonal and daily weather patterns on the growth and development of crops grown in Alberta. To show the correlation between plants' response to weather conditions and the economic returns to Alberta's farmers. To give students an opportunity to practice their math skills.
Materials Required:	Assembled game board and accessories supplied in the manual. Token Farmers (4 - 6) 1 Dice 1 copy of tally sheets per player Pencil Calculator to assist with math if desired Further Information - "The Climate"
Time Required:	2 class periods

To the Teacher: This game focuses on math skills, is quite complex and is therefore best for "good" students.

PROCEDURE:

Part 1

Introduction:

This game focuses on weather factors which influence the agricultural industry in Alberta.

1. The lesson may begin by discussing today's weather. Is it good or bad? What season is it? Is this the kind of weather we expect in this season? How do you feel about weather? How does weather affect your life?

2. Discuss some people whose life styles are influenced by the weather. (Fire fighters, parks officials, resort owners, airlines, road construction workers, farmers.)

3. The exercise today is a game of chance. This game reflects a real life situation. It will help us to appreciate the economic effects weather has on one of Alberta's largest industries - agriculture.

Part 2

The Rules:

1. Divide the class into groups of 4 - 6 students.

2. Discuss with the class the rules of the game. Make sure that each group has a copy of the rules and a game set.

Part 3

Assemble the game:

3. Have each group assemble their game board.

4. Each group will require 2 dice and each member of the group should have a token "man" which he will use to play the game. These are not supplied with the kit. Each player must be able to identify his own token.

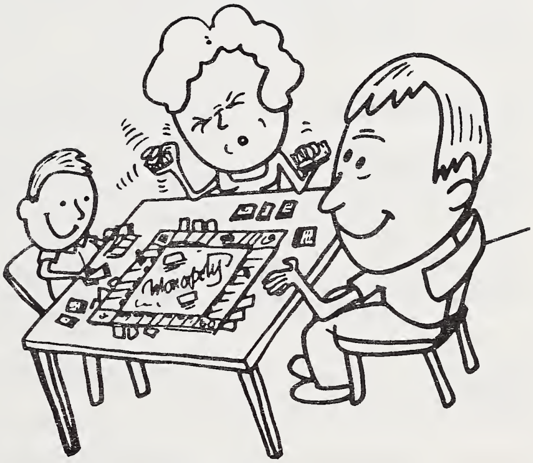
Part 4

Scoring:

5. Have each group review their tally sheets. These will be used to record the volume and value of their crops throughout the game. They will have to utilize some of their math skills when the game is finished to establish the placings of each group member.

Part 5

PLAY THE GAME



GAME RULES

1. Read all the rules carefully before proceeding with the game.

2. All calculations should be done after the player gets to the finish. Do not add in advance. You will have to do it again. Use a calculator to assist you if your teacher permits.

3. To Start - roll the die. The player with the highest count goes first.

4 Advancing tokens around the board. Roll the die and move your man the number of squares indicated. If you land on a blank square, you must roll to find the weather conditions. The season is indicated on each square.

5. Weather conditions and crop yields. After each move players must roll again to find out the weather conditions. If a player's man has arrived on a "spring" square, he must roll the die and then look on the Spring weather conditions guide and follow the directions of the number of his roll. These will be recorded on his tally sheet under the grain field that he is in at the time.

   Example: Player 1 has a man on Summer Barley. He rolls the die and turns up a 3. The summer weather conditions guide tells him that the weather is "Good warm growing conditions". Gain 50 Units of crop.

The player will then enter 50 on the plus side of his Tally sheet for Barley.

6. If a player lands on a "crop insurance" square, he may purchase crop insurance by debiting his crop 10. If he chooses to take out crop insurance, the next crop loss condition that he rolls is not recorded on the Tally sheet. Do not roll for weather conditions.

7. Do not pass the black square untill you establish your crop yield.

   Each time a player gets to a black square (the last square of each field) he must roll the die to find his crop yield. Multiply the number shown on the die by 1000 to get his crop yield for that field, proceed to the new field.

   Do not calculate crop values until the end of the game!

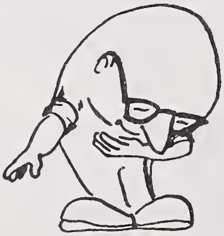
8 Crop Values. When a player has moved out of the Barley field, he will still be at the mercy of the weather. Some squares will indicate favourable and unfavourable weather conditions for crop values. He will then find if he gets a bonus or a penalty on his crop values. These must be established before final calculations of Net worth are made. These losses or bonuses apply to all crops.

   Example: a bonus for "seed" quality may make all of his crops worth $.50 more per unit.

9. Players finishing first receive a bonus of 100 units of each crop.

   Players finishing second receive a bonus of 50 units of each crop.

10. The winner is the player who has accumulated the most valuable crops. The final tally sheet number.



weather conditions

Spring Weather Conditions Guide

1	Excellent Warm Weather	+ 50 Units
2	Dry, windy weather; causes Soil erosion	- 30 Units
3	Good conditions; finished seeding early	+100 Units
4	Cool spring; late germination	- 50 Units
5.	Heavy rain, tractor stuck in mud - miss a turn	
6.	Hot dry windy spring - sparse germination	- 25 Units

Summer Weather Conditions Guide

1.	Three day gentle rain, mid-June	+ 50 Units
2.	Warm Sunny weather	+ 50 Units
3.	Warm August, crops maturing well	+ 30 Units
4.	Heavy Hail, extensive damage	-100 Units
5.	Hot weather, causes drought	- 75 Units
6.	Cold, wet - August crops mature slowly	- 25 Units

Fall Weather Conditions Guide

1.	10 day dry spell in September, harvest ½ complete	+100 Units
2.	Rainy September - miss 2 turns	
3.	Warm windy weather	+ 75 Units
4.	Snow in early October	-100 Units
5.	Early evening dew, slows harvest	- 25 Units
6.	Late frost, good grain yield	+ 50 Units

TALLY SHEET

WHEAT

+ Gains	− Losses

Total ______

Subtract losses

Wheat Yield: ______

Basic Wheat Price: $4.50 per unit (bushel)

Add or subtract bonus or penalty ______

Wheat price ______

× Wheat Yield ______

CROP VALUE ______

OATS

+ Gains	− Losses

Total ______

Subtract losses

Oat Yield: ______

Basic Oat Price: $1.50 per unit (bushel)

Add or subtract bonus or penalty ______

Real Oat price ______

× Oat Yield ______

CROP VALUE ______

HAY

+ Gains	− Losses

Total ______

Subtract losses

Hay Yield: ______

Basic Hay Price: $2.00 per unit (bale)

Add or subtract bonus or penalty ______

Hay price ______

× Hay Yield ______

CROP VALUE ______

CANOLA

+ Gains	− Losses

Total ______

Subtract losses

Canola Yield: ______

Basic Canola Price: $6.00 per unit (bushel)

Add or subtract bonus or penalty ______

Canola price ______

× Canola Yield ______

CROP VALUE ______

BARLEY

+ Gains	− Losses

Total ______

Subtract losses

Barley Yield: ______

Basic Barley Price: $3.00 per unit (bushel)

Add or subtract bonus or penalty ______

Barley price ______

× Barley Yield ______

CROP VALUE ______

Wheat Crop Value: ______

Oat Crop Value: ______

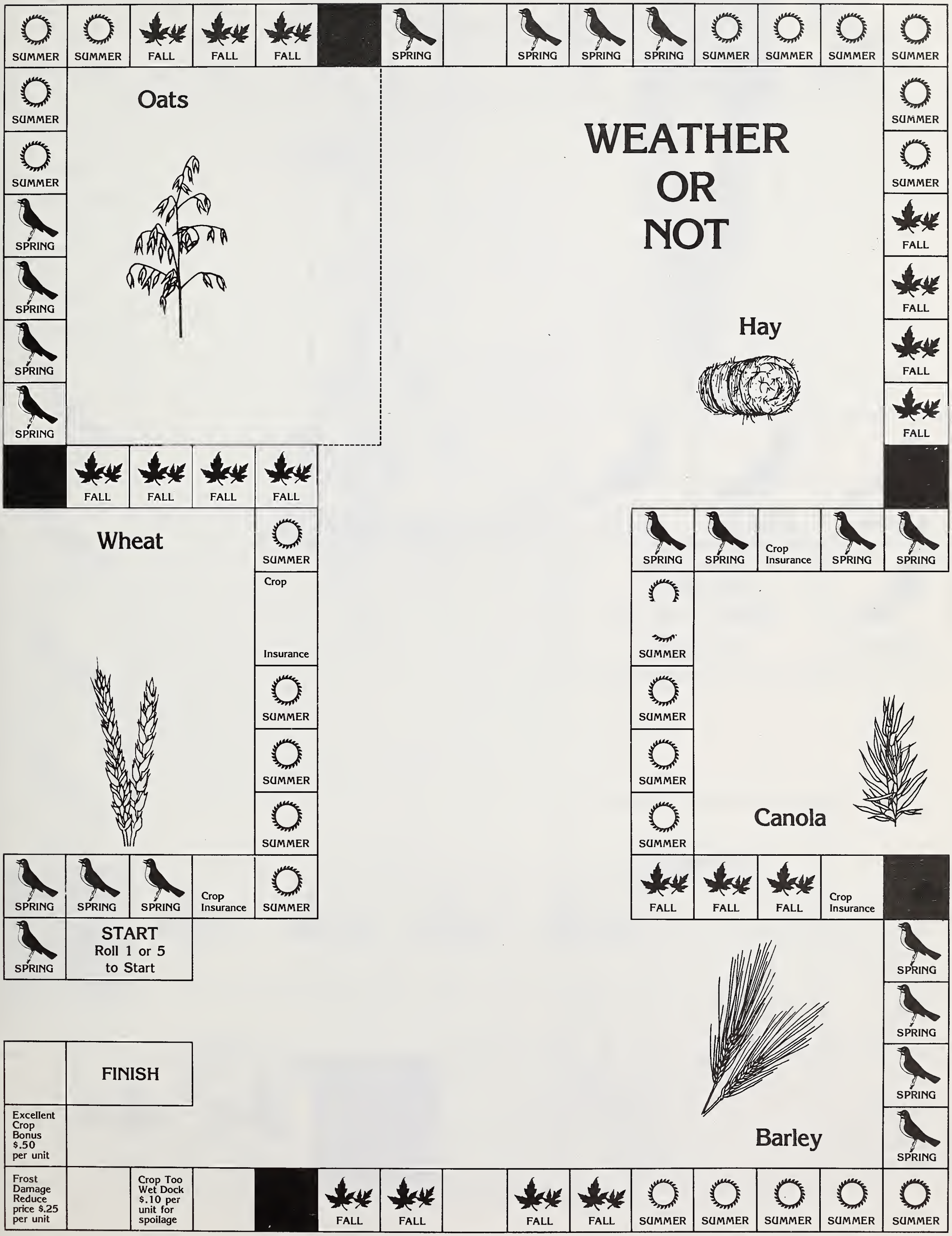
Hay Crop Value: ______

Canola Crop Value: ______

Barley Crop Value: ______

TOTAL CROP VALUE ______

WEATHER OR NOT



Insurance

SUMMER

SUMMER

SUMMER

SPRING

SPRING

SPRING

Crop
Insurance

SUMMER

SPRING

START
Roll 1 or 5
to Start

FINISH

Excellent
Crop
Bonus
$.50
per unit

Frost
Damage
Reduce
price $.25
per unit

Crop Too
Wet Dock
$.10 per
unit for
spoilage

FALL

FALL

SUMMER
SUMMER
FALL
FALL
FALL
SPRING

SUMMER
SUMMER
SPRING
SPRING
SPRING
SPRING

Oats

FALL
FALL
FALL
FALL
SUMMER
Crop

Wheat

SPRING SPRING SPRING SUMMER SUMMER SUMMER SUMMER

WEATHER OR NOT

SUMMER

SUMMER

FALL

FALL

FALL

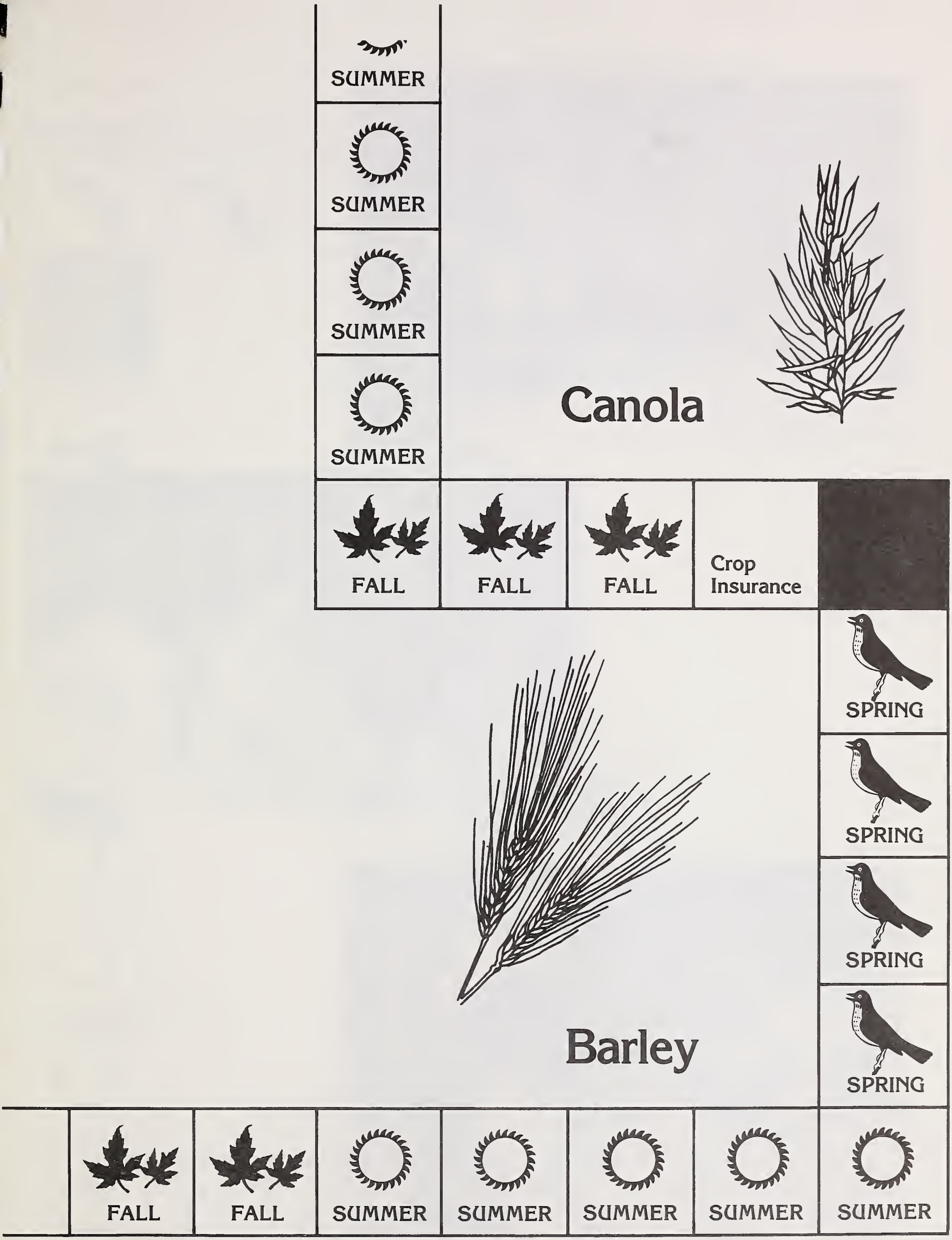
FALL

Hay

SPRING SPRING Crop Insurance SPRING SPRING

PARTICIPATE

in the Weathe
or Not Game.


SUMMER
SUMMER
SUMMER
SUMMER
Canola
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Crop Insurance
SPRING
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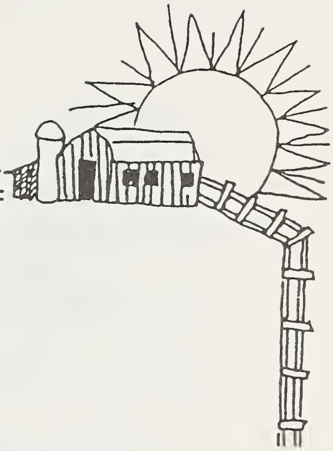
Lesson 13

EROSION, SOIL LOSS - FARMING TECHNIQUES



Subject Area:	Science
Curriculum Direction:	Earth/Space/Time Water and Land
Secondary Subject Area:	Language Arts - Reading for information.
Lesson Concept:	Man's actions may contribute to both the cause and controls of erosion.
Purpose:	To encourage students to prepare and utilize an action plan. To recognize signs of erosion in your area. To improve research reading skills.
Materials Required:	Supplied in the lesson. Further Information - "Soil Conservation"
Time Required:	3 - 4 Class Periods.

PROCEDURE:

Part 1

Introduction:

Erosion is a natural phenomenon which constantly causes change in the earth's surface. It is the process by which the earths surface is slowly being worn down. The four main causes of erosion are: water, wind, ice and gravity. Wind and water cause the most soil loss due to erosion on Alberta's farms.

Most of the nutrients required by plants are contained in the top six inches of soil. If this life giving substance is removed, the land can lose it's ability to nourish the crops farmers plant. Vast areas of unproductive land can be thus created.

Farming practices may contribute to both the cause and control of agricultural soil erosion. In this exercise, students will look at some farming techniques which have affected soil erosion losses in Alberta.

Part 2

Listening and making notes:

1. Explain the work sheet "Take Action" with the class.
2. Read the case study on Soil Erosion and have the students fill out the work sheet. (This is a good illustration of a problem, an action plan and a solution which is a part of Alberta's agricultural history).

Part 3

Action Plan:

1. Look for evidence of soil erosion in your area. (This need not be related to Agriculture).
2. Using the work sheet "Take Action" make an action plan for solving the problem.
3. If it is possible, implement your action plan. This may be done through your own efforts or by alerting agents who may be able to work for you.

Conclusion:

1. Review the completed worksheet.
2. Review the results of your actions. Make further plans for action if required.

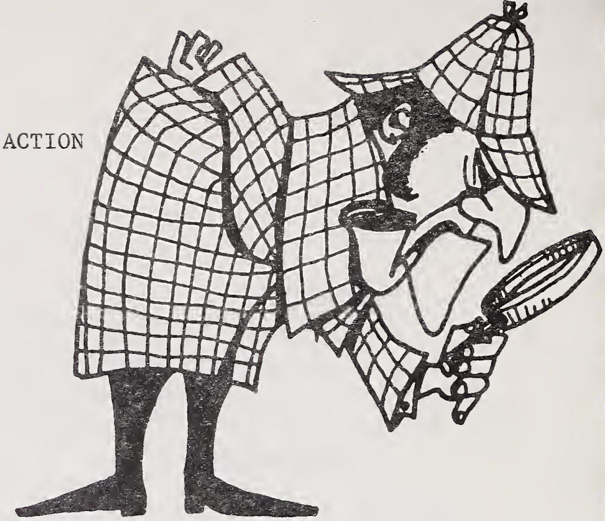
For Discussion:

1. How has this action plan affected your life?
2. What might have happened if no action had been taken?
3. How did the action plan affect the farmers involved?
4. What did the farmers learn about their business?

Related Activity:

1. Write a short account of your findings and action and submit it to the local newspaper to inform others of your efforts and concern.

Worksheet



TAKE ACTION

1. State the problem.

____

____

____

____

____

2. Suggest several possible actions that may help to correct the problem.

   1.

   2.

   3.

   4.

   5.

   6.

   7.

   8.

3. Choose the best actions and prepare a 3 step Plan of Action:

   1.

   2.

   3.

4. Results - Was a solution found to the problem? How did the plan work?

Recalling those times later, Mr. Palmer wrote:

> It is a memory burned into my brain by months and years of hot winds; by driving through miles of drifting soil so dense in the air that the radiator cap was hardly visible; by seeing miles and miles of good farm land drifting like snow into piles so high that you could not tell where one farm ended and the next one began, the fences being covered; by watching farmers and their families dig their machinery out of drift piles and load them with their household effects on their wagons or trucks and start with their families for the park belt of the north, leaving behind their half covered house and their years of toil and hope. As I think back on those experiences, I find my memory sharp indeed.

As far back as 1919, there had been those who had become alive to the soil drifting danger. How strip farming started was told in 1946 by Chris T. Withage, operator of the Canada Department of Agriculture Illustration Station at Nobleford. In a letter to R.M. Putnam, later deputy minister for the Alberta Department of Agriculture, Mr. Withage reported that this practice originated in the Monarch district, northwest of Lethbridge. He was one of the first farmers to employ strip cropping practices.

He related how, in 1919, he was bringing home a cow from Granum. The whole countryside was drifting, and he noticed as he travelled eastward along the road that there was no blowing on summerfallow lying just to the east of fields that had been in crop. "If there were more west sides to our summerfallow fields", he told himself, "we wouldn't have this soil drifting". So he conceived the idea of running strips up and down the field across the direction of the prevailing wind, so that there would be more west sides to the fields.

The practice of strip cropping was so successful that it was adopted as general farming practice all over those sections of Alberta where soil drifting was a menace. The strips varied from 10 to 50 rods in width, the average being about 25 rods. They were at right angles to the prevailing wind and usually ran north and south. (1 rod=16.5 feet)

It was in that year (1935) too, that the Prairie Farm Rehabilitation Act was introduced in the Federal House of Commons. In an address delivered to the Eastern Ontario and Central Ontario Locals of the Canadian Society of Technical Agriculturalists in January, 1938, Dr. E.S. Archibald, Director of the Experimental Farms Service at Ottawa, spoke of the prairie situation since 1929. In the course of his address he remarked:

> Succeeding years of disastrous drought, grasshopper damage, soil drifting, and necessary large scale relief to farmers in central and southern Saskatchewan, southwestern Manitoba, and southern Alberta, covering a period of five years, inclusive of 1934, convinced the Dominion Government that drastic and large scale

rehabilitation measures were necessary if the enormous earning power of Western Canada due to a population of most capable farmers in their particular type of production was to be retained.

With the start of the Prairie Farm Rehabilitation Administration in 1935, a new attitude towards land conservation began.

Soil conservation, it was recognized, was the responsibility of all, and not alone of the man on the land. Assistance was offered with small scale irrigation systems; farmers received help in obtaining water supplies for stock and in the building of dugouts and stock watering dams. Regrassing projects were carried out, new plant variety possibilities explored, and new cultural methods were tested and applied. Purebred sires for community pastures were provided to help produce good quality cattle for the United Kingdom fresh meat trade.

Alberta Agriculture Historical Review

DROUGHT AREA

(No one could possibly realize, unless you lived there, just what a drought of ten years means, when you see everything you ever owned in your life being eaten up with drought and crop failure, your cattle starving, your horses dead, it is hard).

Just sort of holding on for one more crop
Hoping and praying that the drought will stop,
Watching the brassy brightness of the sky,
Hearing the hollow sound of the wind's cry,
My neighbor's face reflecting clear and plain
The aching hope of everyone for rain.

They're holding on - you know how soldiers cling
To the last broken trench when everything
Looks lost, and only battered bodies know
That dogged faith that will not let them go-
And so they stick to these brown fields and wait
And hope for rain before it is too late.

The women, too, these gallant pioneers
Who dare not give away to fruitless tears
Standing behind their men, in bright array,
Cheering them on ... living from day to day,
A shining host holding these Western lands
In the safekeeping of their calloused hands.

Beside Still Waters
Edna Jaques

Men Against The Desert

The first Reclamation Stations were established in 1935 on some of the worst drifting land within the Palliser Triangle, at Melita, Manitoba, and at Cadillac, Saskatchewan. On the Cadillac station, for example, there were stretches where the land was drifted to a depth of four and five feet. South of Ponteix, it drifted so badly across Highway 13 that the worst drifted stretch of road was abandoned. Peter Janzen, who was in charge of the project, managed to get the whole section, highway and all, seeded to spring rye. After the crop came up the Highway Department was invited back to reopen the highway. Over much of Saskatchewan it was as common for farmers enroute to town to become trapped in soil drifts across the roads in summer as by snow drifts in winter.

Perhaps more important than the Reclamation Stations, however, were the Experimental Farms sub-stations which were set up during 1936. The plan was very simple. Farmers were asked to place their farms under the direction of the P.F.R.A.* supervisor who would lay out a wind-proofing plan for them. In return for co-operation, the farmers were each paid $600.

The task of organizing the sub-stations fell to Herb Chester of the Lethbridge Farm. A great many sub-station contracts were signed in the early winter of 1936 so that when spring came the Experimental Farms crews could get onto the blowing land quickly. Once the soil was stopped blowing, field days were organized and the farmers from miles around were invited in to see what had been accomplished.

The sub-stations had one very great advantage over the Reclamation Station when it came to demonstrating the effectiveness of erosion control measures. The sub-stations were still being farmed, though with great difficulty in face of the drought and blowing soil. The Reclamation Stations, of course, were located on abandoned land on which nothing was growing. Thus the farmers who came to the sub-station demonstration could see conditions much like ones they had on their own farms and have the effectiveness of the recommendations demonstrated for them. It was while their interest was highest and their attention sharpest that Sherriff or Chester, or Purdy or Janzen moved in to get an Agricultural Improvement Association (A.I.A.)organized. And of course the best propagandist for the A.I.A. was L.B. Thomson himself whose faith in the future of the Palliser Triangle never wavered. For Thomson, soil conservation was a religion that generated an unmatched missionary zeal.

A farm meeting without L.B. Thomson was almost unheard of, for he would drive all day and half the night to get to one. There was the day in July 1937, when Herb Purdy recalled getting a call from Thomson asking him to get a car and call for him at 4 o'clock the next morning. They drove from Swift Current to Regina, over the rough gravel highway and through the dust, for a P.F.R.A. meeting that lasted most of the day. Then they headed for a farm meeting in Meyronne in the heart of the southwestern dust bowl. They got there just before dark and Purdy ran the meeting till Thomson finished his supper. Then Thompson spoke while Purdy ate. They got back to Swift Current just before dawn with over 450 miles of gravel and dirt road travel behind them. No one could keep up with Thomson for long, but his non-stop effort was illustrative of the intensity of the personal drive which was so characteristic of the people who fought the dust and wind throughout the Dirty Thirties.

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* P.F.R.A. - Prairie Farm Rehabilitation Administration

In their first offensive against the blowing soil, particularly on the Reclamation Stations, the Experimental Farms people tried everything and anything. They listed* the blowing sand in the spring, summer, fall and winter and kept track of results. Sometimes they had to go over the same fields several times within a matter of days. They listed it over wide stretches and over narrow stretches with varying widths of unlisted strips in between. As has been noted previously, they tried modifications of every kind of cultural equipment that turned up. Between the ridged areas, and into the bottom of the furrows, they planted everything that might grow. They experimented with sudan grass, corn, sunflowers, wheat, oats, rye and once even tried growing hemp until the R.C.M.P. pointed out that hemp was illegal in Canada.

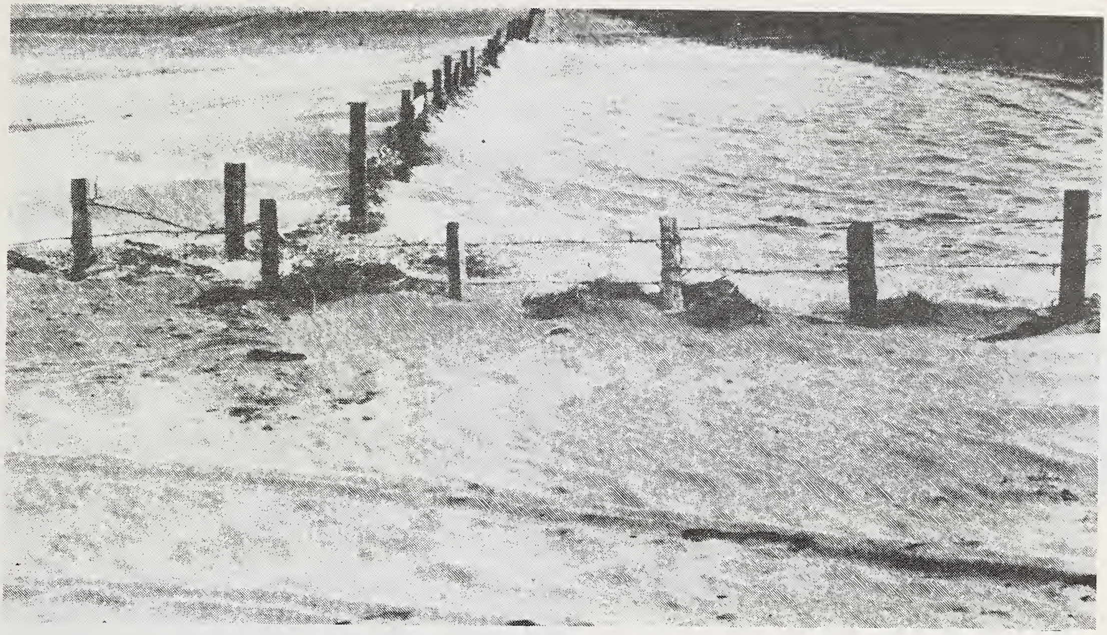
The value of such experimenting, of course, lay in the authority it gave the experimenters when they came to advise the farmers what was likely to work when their land had reached the disaster level of that in the Reclamation Stations. Nobody could have worse land, or worse blowing soil than was to be found on the Melita, Estevan, Cadillac, Kisbey and Aylesbury Reclamation Stations. By using every crop imaginable, every cultural practice imaginable, and every modification anyone could think of to all the available machinery, they quickly acquired the answers to the problems particularly relevant to the areas in which the Reclamation Stations were located. They could help the farmers through their Agriculture Improvement Association (A.I.A.) to tackle their own problems and back their suggestions with a solid body of fact. They could show the farmers how to modify and utilize their own equipment. That was what the campaign to control erosion had to rely on - the equipment the farmers had regardless of how badly worn it happened to be, and the efforts of the farmers themselves to save their farms.

Men Against The Desert

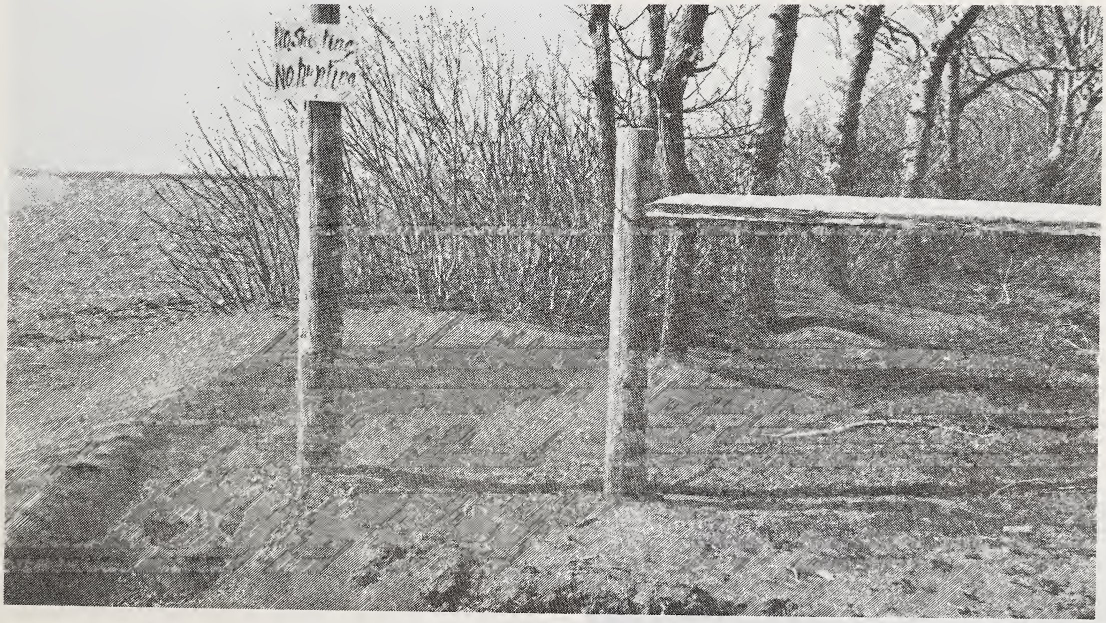
Editors note:

* List: A cultivation technique which created small pockets in the soil to trap and retain moisture.

THE PROBLEM



1. Top soil from ¼ section land piled up along fence line A5668 1952



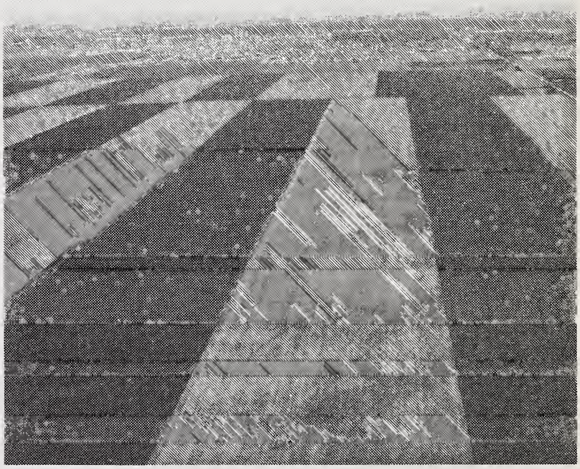
2. Soil drifting on irrigated land NE of Coaldale A5669 1959

Provincial Archives of Alberta

THE SOLUTION

Shelter Belts

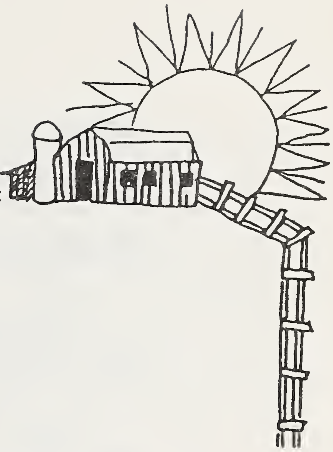
Strip Farming



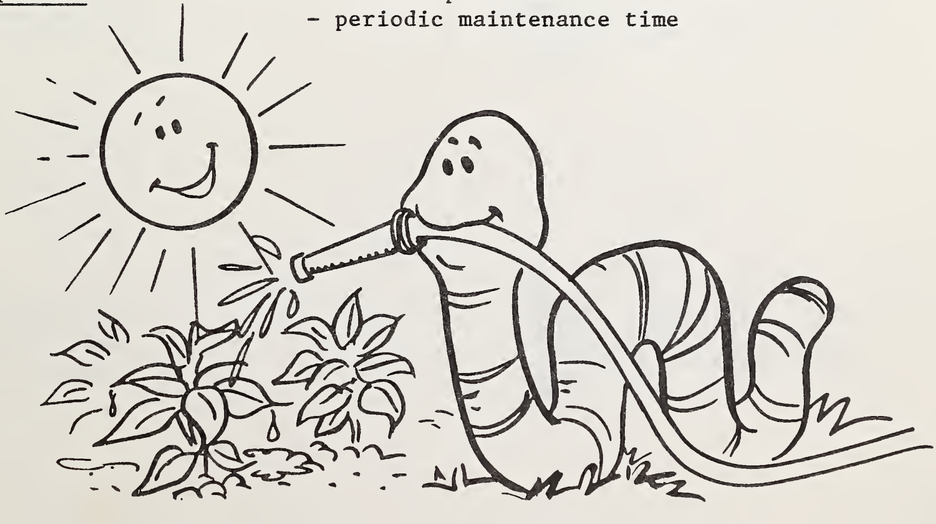
Trash Cover Cultivation

Lesson 14

IRRIGATION



Subject Area:	Science
Curriculum Direction	Earth, Space, Time, Water and Land
Lesson Concept:	The relationship of land productivity to soil and water. Vegetation depends on water.
Purpose:	To discover some of the differences in various soil types. To create a student design and construction of a working irrigation system. To participate in taking care of living organisms.
Materials Required:	- Large cardboard box - coarse sand - various samples of soil - grain or small vegetable seeds - water source - plastic
Time Required:	- 2 class periods - periodic maintenance time



PROCEDURE:

Part 1

Introduction:

Irrigation occurs when plants are supplied with water to assist their growth and development. Watering houseplants or home gardens may be a familiar example of irrigation.

Look at the basic requirements of most plants. Water, air, sunlight, soil, and nutrients.

Individual plants have different needs. Students may understand that cacti require very little water, while some tropical plants can exist in limited light. There are species of plants that can exist without soil.

The plants that we are concerned with in this lesson are agricultural plants. Plants that are grown for food.

Some areas of Alberta are limited to the types of plants that can be grown because of an insufficient rainfall and high velocity drying winds. Under these conditions, only hardy short grasses thrive in the natural state. If soil conditions permit, the application of water in some of these dry regions can greatly increase the variety and volume of crops that can be grown.

Plants grown indoors can suffer from drought. Therefore, it is a worth while classroom exercise to try a field irrigation experiment. In this activity, the students will construct a working model of a surface irrigation system.

Part 2

Construction of the Crop Field

1. Use a large, sturdy cardboard box. The base should measure at least 60 cm by 60 cm. Cut the box down to about 30 cm high.

2. Line the box with a single sheet of plastic. This should be strong enough to take a little wear and tear. Staple the liner to the sides of the box.

3. Fill the bottom of the box with about 10 cm of coarse sand. (This will prevent flooding of the field.)

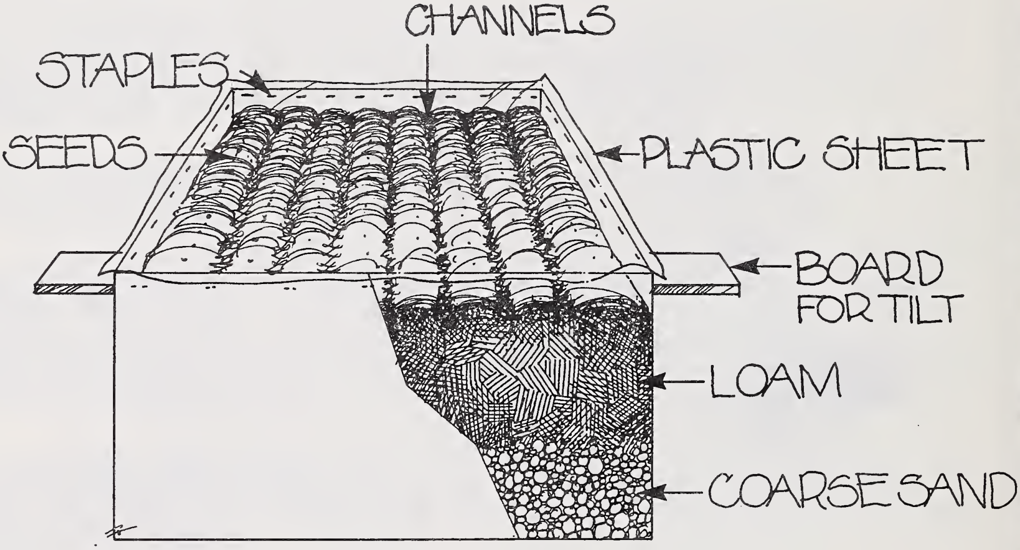
4. Put loam on top of the sand. This soil is best taken from a natural area. The use of bagged potting soil may result in a mixture that is too porous for the water to run in the channels. The type of soil will greatly affect the success of this activity. It is best to do the Soil Test experiment with the soil in order to make the best choice of available soil.

5. Pack the soil into the box quite firmly and form channels in the soil about 7 cm apart. (See the illustration.)

6. Set the box on a board and prop it at a slight angle. (About 3-5 cm.)

7. Try to apply some water to your field and watch to see that the water uniformly moistens the soil. (Adjust the channels to assist water flow.)

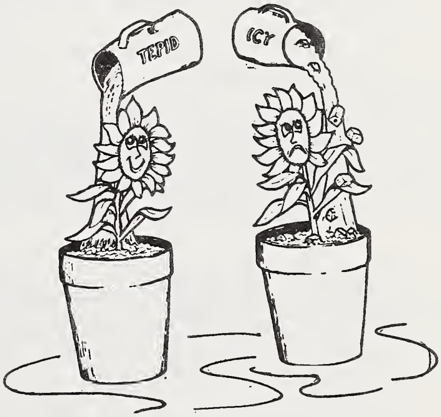
8. Plant some seeds in the ridges - between the irrigation ditches. You may choose one row of oats - one of barley and one of wheat. If these are unavailable, lettuce and radish will work well too. Make sure that when the water is turned on to the field that it penetrates the soil but does not wash out the seeds.


CHANNELS
STAPLES
SEEDS
PLASTIC SHEET
BOARD FOR TILT
LOAM
COARSE SAND

Part 3

Growing Tips

9. Make sure that the soil over the seeds is firmly packed down so that the seeds will remain moist through the germination stage. (The field may be covered with light plastic propped up on sticks so that it is not touching the soil. This will prevent drying. This green house cover should be removed and irrigation begun as required as soon as the seedlings appear.)
10. The best location for your crop field is in a cool sunny window. Plants grown in the dark may become weak and rangy.
11. Do not over water your crop. This may make the plants weak. Use a water meter used for potted plants to check the moisture at the root level of the plants.
12. You may wish to fertilize your crop. The application of 20-20-20 fertilizer in the recommended solution will probably be effective.



Soil Test:

Use several identical jars filled with a variety of soils to help the students discover how their irrigation system will operate.

1. Put different soil mixtures in each jar and pack down quite firmly. (Label the jars.)
2. Add ¼ cup of water to each jar and measure how far the water penetrates the soil in each jar.
3. Rate the water movement in each of the samples. Students will notice that there is little penetration in a jar full of clay, while the sand lets the water go straight to the bottom. This is due to the size of the soil particles. Neither of these soil extremes would be ideal for their farm. Choose the soil best suited to their irrigation project.
4. Choose a soil that absorbs the moisture at a moderate rate while keeping a small amount on the surface. This will allow for even distribution along the irrigation ditches.

The following is quoted from the publication, "Irrigation in Alberta", Alberta Agriculture.

Irrigation in Alberta

The development of irrigated land in Western Canada has progressed for more than 75 years. Water resources have been partially developed, and the engineering problems associated with water storage, diversion, and delivery to the farm are well understood. Procedures for handling water on the farm are still being developed and irrigation methods are being improved. This bulletin outlines the history of irrigation and discusses some of the unresolved problems.

History of Irrigation in Alberta

Water for Alberta's first irrigation scheme was diverted from Fish Creek, now at the southern edge of the City of Calgary, in 1897.

Further development centred south and east of Calgary and falls into four phases:

- company (or private development) phase (1890 - 1915)
- irrigation district (or co-operative) phase (1915 - 1940)
- government phase (1940 - 1969)
- cost-sharing phase (1969 - present)

As compensation for their effort in establishing railways across Canada, the development companies (Canadian Pacific Railway, Alberta Railway and Navigation Company) obtained large blocks of land in southern Alberta from the Canadian government. The companies turned to irrigation development as the best means of paying for the railways and colonizing the land. During this, the company phase, four major areas were constructed and introduced to irrigation.

In the late 1890's, Alexander T. Galt and his son Elliot T. Galt, with the assistance of the Mormon Church, diverted water from the St. Mary River at Kimball (southeast of Cardston) and through a series of constructed and natural channels, brought this water to the areas of Magrath, Raymond and Lethbridge. The first water was turned out through the Kimball headgates on July 4, 1900 and reached Lethbridge at the end of that same month.

In 1903, the Canadian Pacific Railway began construction of an irrigation system east of Calgary and a canal and lateral system in the Strathmore area, known at the times as the Western Block. With this project about 200,000 acres were envisioned as being under irrigation.

In 1909, the CPR began construction of an irrigation system in the Brooks area consisting of a diversion structure on the Bow River near Bassano, and an extensive canal and lateral system between the Bow and Red Deer rivers. Known as the Eastern Block, it anticipated development of about 400,000 acres of irrigation.

In 1909 an English firm called the Southern Alberta Land Company, along with some smaller companies started an irrigation system by diverting water from the Bow River, near Carsland, to irrigate a large block of land in the Vauxhall area with the intention of making a profit from the sale of irrigable land. This venture anticipated the development of approximately 240,000 acres of irrigated land. The companies eventually merged to form the Canada Land and Irrigation Company. (See map inside back cover.)

All of these projects suffered from financial difficulties in various degrees, and none of them, to date, has fully achieved its projected development. The St. Mary project was taken over by the provincial government in 1946 and later became an irrigation district with the enactment of The Irrigation Act in 1968. The Western Block of the CPR project was taken over by the farmers of the area and was organized into the Western Irrigation District (under The Irrigation Districts Act) in 1944. It acquired all assets and rights-of-way and a cash amount of $400,000. About 80,000 acres are presently on the assessment rolls of the district.

The Eastern Block of the CPR project was taken over by farmers in 1935, and was organized into the Eastern Irrigation District also under The Irrigation Districts Act. The transaction included all assets and rights-of-way, a block of land comprising 600,000 acres plus a cash amount of $300,000. Approximately 235,000 acres are presently on the assessment rolls of this district.

In 1915, just ten years after it had become a province in the Dominion of Canada, the Government of Alberta enacted The Irrigation Districts Act. The legislation set the stage for the "district" (or co-operative) phase of irrigation development. This permitted the farmers of an area to organize for the purpose of floating a bond issue to raise funds to construct an irrigation project. The following areas were organized and constructed under the act.

Taber Irrigation District	1919 operational 1921
Lethbridge Northern Irrigation District	1919 operational 1923
United Irrigation District	1921
Mountain View Irrigation District	1921
Magrath Irrigation District	1925 - originally part of St. Mary project, operational in 1900
Raymond Irrigation District	1926 - originally part of St. Mary project operational in 1912
Leavitt Irrigation District	1936 - received assistance from federal government on diversion works and storage reservoir

Eastern Irrigation District	1935 - originally the Eastern Block of CPR and operational in 1912
Western Irrigation District	1944 - originally the Western Block of CPR and operational in 1905

In 1935 the federal government organized the Prairie Farm Rehabilitation Administration (PFRA) to provide engineering and financial assistance on water development projects on the prairies, thus initiating the government phase of irrigation development. One of its first projects in Alberta was the development of a storage, diversion and main canal to supply water to the Aetna Irrigation District in 1945. This development also ensured a better water supply to Mountain View Irrigation District and the Leavitt Irrigation District.

The federal and provincial government works consisted of a massive system of reservoirs and canals to ensure water supply to the Magrath, Raymond and Taber Irrigation District and the CPR project in the Lethbridge-Coaldale areas, as well as the expansion of irrigation from Taber to Medicine Hat. Among these works were:

- St. Mary Reservoir
- Milk River Ridge Reservoir
- Jensen Reservoir
- Chin Reservoir
- Waterton Reservoir
- Belly River Diversion
- Main canal network connecting all these reservoirs
- Main canals and distribution canals to permit approximately 180,000 acres of irrigation from Taber to Medicine Hat.

The cost of these works was shared between Canada and Alberta, with Canada providing all the engineering, the capital expenditure on the Waterton, Belly, St. Mary, and Ridge Reservoirs and the connecting main canals. Alberta provided the financing for all of the works beyond Ridge Reservoir to Medicine Hat.

The government of Canada bought out the Canada Land and Irrigation Company in 1950 and began rebuilding the works of that area including additional storage in Traverse Reservoir, enlargement of Lake McGregor Reservoir, enlargement of the main canal from the Bow River near Carsland to the end of the present project near Hays, and development of a major lateral distribution system in the Hays area. Alberta became involved in the project with construction of a major lateral distribution system in the Enchant, Traverse, and Lomond areas.

By the early 1960's, the works of the older irrigation systems were nearly 60 years old, and the structures were in a state of extreme deterioration. Replacement funds were not available to take care of this work. Representation was made to senior governments for assistance, and as a result a joint irrigation study was completed in 1967, the purpose of which was to identify the beneficiaries of irrigation.

The major recommendation of this study was that the cost of rehabilitation of the irrigation systems should be shared among the two senior governments, the local municipality, and the irrigation farmers. A new irrigation act was passed in 1968 which put the administration of all irrigation under one piece of legislation, introducing the "cost sharing" phase of irrigation. The major undertakings in the first few years of this phase were the rehabilitation of the older systems, and the provision of extensive seepage control on district canals.

Under the terms of a 1973 agreement between Canada and Alberta, Alberta took over the operation of all on-stream diversion works operated up to that time by Canada, as well as the Bow River project in the Hays and Vauxhall areas. Subsequently, Alberta established a policy of assuming basic responsiblilty for water supplies to all users, including operation of on-stream diversion works and major reservoirs.

Present Status of Irrigation Development

In 1981 1,063,995 acres in Alberta were serviced by the following irrigation districts:

Aetna	3,087
Bow River	174,706
Eastern	231,127
Leavitt	4,476
Lethbridge Northern	113,884
Magrath	10,963
Mountain View	3,710
Raymond	35,385
Ross Creek	1,716
St. Mary River	299,548
Taber	70,819
United	33,307
Western	81,307
	1,063,995

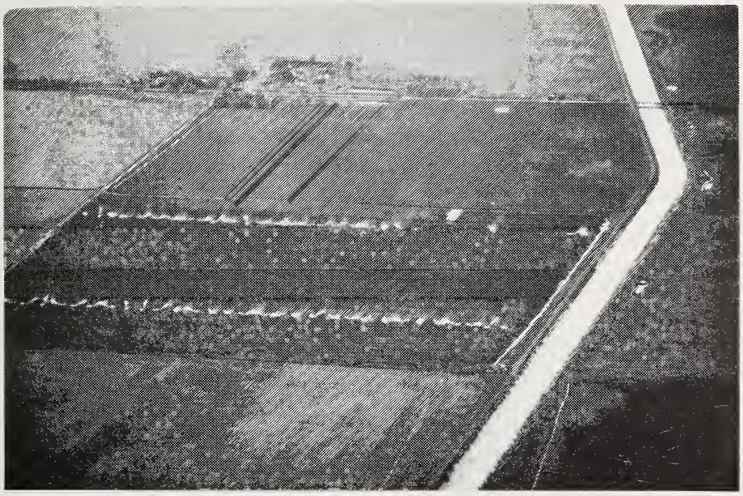
Irrigation Methods

There are three methods of applying water: surface, sprinkler, and subsurface. To date the last method is not in use in Alberta in any field installation.

With the surface method, water is applied to the soil at the ground level. It flows by gravity over the surface of the field. For close growing crops such as grain and grass, water is spread over the soil surface by using (a) border dikes, (b) border ditches, (c) contour ditches or (d) corrugations.

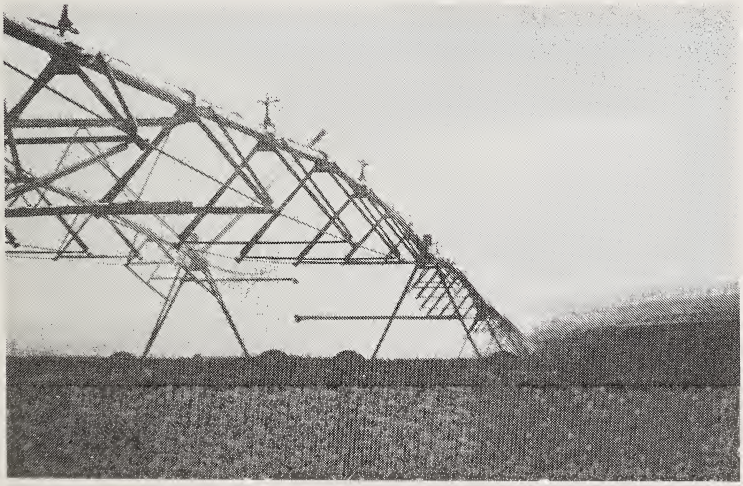
"Trickle" or "drip" irrigation uses a system of plastic pipes to convey the water across the ground. The water is directed to the soil surface by drippers spaced close together on the pipe. It is designed to operate nearly every day. The "trickle" system is generally costly to install, but gives very good results, particularly on greenhouse and vegetable crops.

With the **sprinkler method** the water is sprayed into the air and falls to the ground like rain. This is usually accomplished by using rotating impact sprinklers, spray heads or perforated pipe. There are many kinds of manual, semi-automated sprinkler systems available for use in Alberta, and the particular kind chosen will depend on many factors.



Irrigation ditch brings water to the field.

Many crops benefit from irrigation



Sprinkler method.

Lesson
15

ENVIRONMENT OR ADAPTATION

Subject: Science

Curriculum Direction: Living things and Environment.
Environmental Factors
Adaptation

Lesson Concept: Farm management uses both modification of environment and development of adaptation trying to achieve maximum production.

Purpose: To show the practical application of knowledge of the environment and adaptations in a familiar industry.

To identify actions which are specifically related to the environment or adaptation development.

Materials Required:
- Supplied in this manual
- Optional - plants or seeds for experimentation

Time Required: 1 - 2 class periods

PROCEDURE:

Part 1

Introduction:

Two ways for organisms to thrive in their environment are:

1. Modify or change the environment to meet the needs of the organism.

2. The organism must develop special characteristics in order to adapt to the environment.

Effective farm management employs both of these strategies to improve the productivity of both plants and animals.

Part 2

Definitions:

1. Discuss "What is an environment?"
"What is an adaptation?"
"How are environments and adaptations related?"

Part 3

Environments:

2. Look at the classroom environment.

Ask the students to suggest ways that the classroom environment has been modified to meet their needs.

3. Present the introduction to this lesson.

4. Have students suggest some ways that farmers might modify the environment of their livestock or crops to encourage greater production.

Part 4

Adaptations:

5. Adaptations are characteristics which are developed to enable an organism to survive in its environment. Examples are webbed feet, seeds in the form of burrs.

Ask students to suggest other common adaptations.

Through selective breeding of plants and animals special characteristics can be developed. These may make the organism more successful in producing food for humans. See how many examples of this form of management the class can suggest.

6. Introduce the Dairy Cow - Example.

7. Have students suggest some other adaptations that farmers might encourage in their plants and animals.

Ask the students to do the work sheet, "Effective Farm Management"

Conclusion:

1. Review the worksheets.

2. Have the students decide which management techniques they could recognize from the road.

3. Which are the responsibility of the farmer?

4. Which depend on the assistance from other people in Agribusiness?

For Discussion:

1. Who are some of the people who might help farmers with their management? Environment? Adaptation?

2. How does good farm management affect the consumer (people in this class)?

Related Activities:

1. Using several plants of the same variety, change the environment and record the results.

2. Using several plants of different varieties, study the effects of environmental change. (i.e. drought resistance, or light sensitivity.)

Good plants to include may be cactus, or low light tropicals.
This will help to show the special adaptations of some species.

Worksheet

EFFECTIVE FARM MANAGEMENT

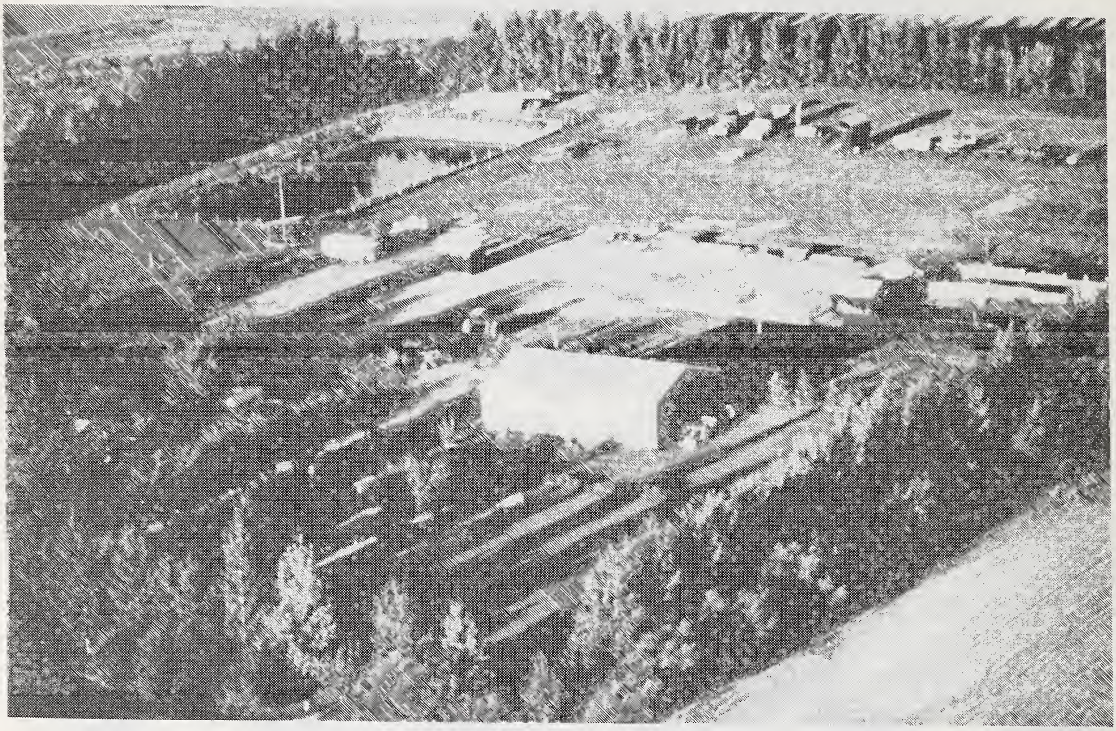
Decide which of the following Farm Management Practices are examples of:

1. Changing the Environment.
2. Developing special Adaptations.

If the example is Environmental, make a "X" in the Environmental column. If the example is Adaptation, make a "X" in the Adaptation column.

Farm Management Practices	Environment Change	Selecting Adaptations
1. Dig water holes in various places in the pasture so cattle will use the whole pasture.		
2. Develop early maturing grain to avoid frost in a short growing season.		
3. Develop special breeds of sheep which grow wool that is good for rug making.		
4. Plant shelter belts to control wind.		
5. Raise chickens that have small bodies and lay good numbers of large eggs.		
6. Make special feeds to help animals grow quickly or produce more.		
7. Keep dairy cattle in small places to increase feed intake and limit exercise so that they increase their milk production.		
8. Develop special wheat with a solid stem which will resist attacks by sawflies.		
9. Irrigate certain areas to assist growth of certain plants.		
10. Laying hens are given extra light in winter to encourage them to continue production.		

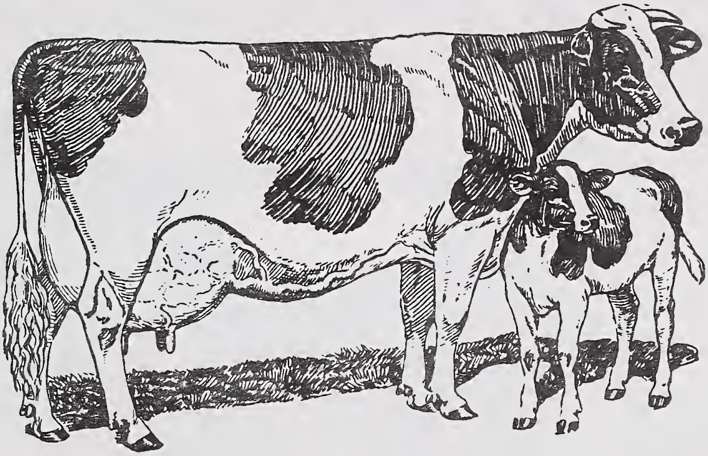
How many environmental changes can you find in this picture?

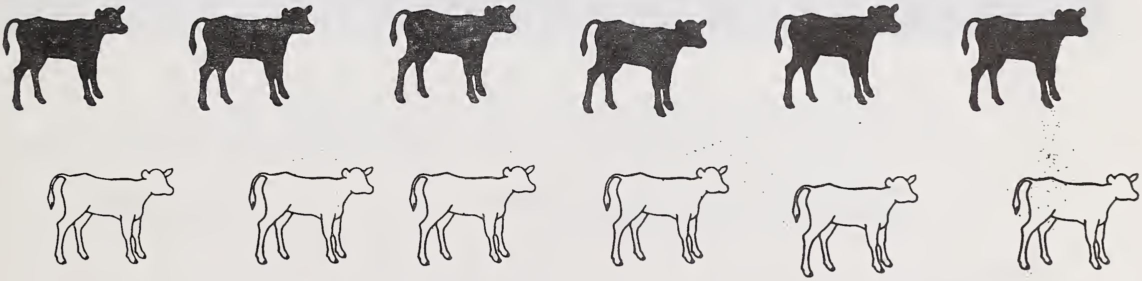


DAIRY COW ADAPTATIONS

People all over the world use dairy products. Milk, cheese and butter are part of the diet in most countries. Although most of the milk is from dairy cows; milk from goats, sheep, water buffalo and horses is also used.

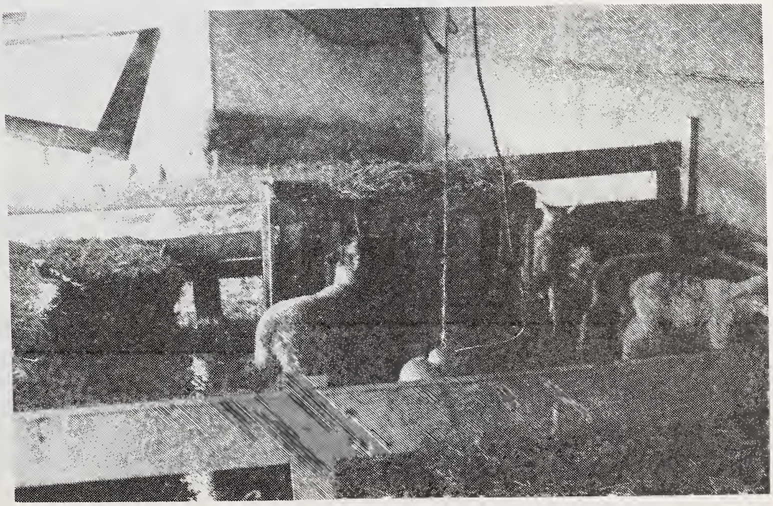
Dairy cattle as we know them, did not always exist. These breeds developed because of careful selection by cattle producers. This was done by breeding the sons and daughters of good producing cows. The good animals were kept and poor producers were culled. Because people used the breeding stock in their area, many related animals were bred to each other. After several centuries this began to produce cattle that looked similar to each other in size, conformation, color and production. As the volume of milk increased, milk and milk products were made available to more people. City dwellers were able to buy the volume of milk they needed daily.





One dairy cow produces enough milk to feed 12 to 15 calves in one year.

Animals raised in controlled environments grow faster.

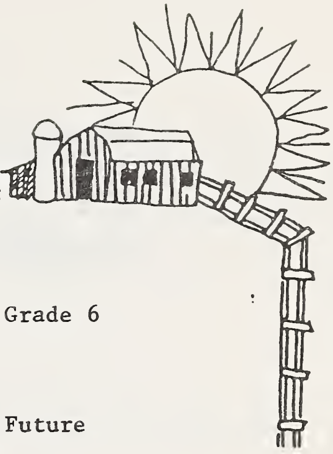


Some plants require special conditions to thrive.

By controlling the environment, plants can be grown out of season.

Lesson 16

PEOPLE, NATURAL RESOURCES AND INDEPENDENCE



Subject Area:	Social Studies - Grade 4 or Grade 6
Curriculum Direction:	Grade 4: Alberta Past, Present, Future Natural resources Human needs Alberta's Links with Canada and The World Trade Self sufficiency Interdependence Grade 6 How People in Earlier Times Met Their Needs Basic Needs
Lesson Concept:	1. Some families are more independent than others. 2. Independence is greater when a person or group has access to natural resources.
Purpose:	To show students how interdependent our families are within themselves and in relation to other families and groups. To evaluate the level of independence of selected family units. To compare independence and interdependence. To illustrate the link between independence and natural resources.
Materials Required:	Supplied in this lesson. Further Information - "Rural Populations and Farm Sizes".
Time Required:	2 class periods.

PROCEDURE:

Part 1

Introduction:

Independence

- Defined as not requiring or relying on others.
- Basic needs are met without the assistance of others.

Interdependence

- Defined as having mutual dependence.
- To depend on one another.
- Through co-operation and effort, all participants benefit.

Part 2

Concepts:

Concept 1:

The term independence can be used to refer to an individual, or a group of individuals who function as a unit. In this exercise, we will be looking at independence in terms of families.

Interdependence. A good example of interdependence is how family members work together towards a mutual gain.

Concept 2:

The independent unit must have access to natural resources. For example, in order to produce ones own food one must have access to some land or soil. Fuel may come from trees, coal or oil products. These natural resources are used to meet our basic needs.

Concept 3:

Man has two very basic needs: food and shelter. Shelter includes such things as the dwelling, clothes and fuel as required.

Concept 4:

An independent family unit can supply their basic needs without assistance from others.

Concept 5: True independence is rare, but there are families who are more independent that others. In this exercise, we will decide if the family is more independent or more interdependent.

Part 3

Independence and Natural Resources:

1. Review the introduction with the class. Some questions to assure understanding may be:

- Can you suggest groups other than families that may be evaluated as to their independence or interdependence. Provinces and countries may be examples.
- How are natural resources related to independence? Can a province which has limited natural resources be independent?

Part 4

Making Comparisons:

2. In the first part of the exercise, we will look at four families. The first two are Indian and the second two are farm families. The children will see how life styles and outside influences make these families more independent or interdependent.

Family A	Indians (year 1600) Alberta plains Indians were able to meet their basic needs from the main resource of buffalo. A family could exist, independent of other families, if they chose to. Most Indian families lived in association with other families in tribes. What would be the advantage of this association? (Protection, more division of labour, social contact.)
Family B	Indians (year 1800) Alberta plains Indians were trading extensively with White traders by this time. Families used weapons, utensils and beads received in trade from the White traders. They were no longer truly independent. The trade associations made the Whites and the Indians more interdependent. The Indians of 1800 were not as independent as the Indians of 1600.
Family C	A pioneer farm family in the year 1906 may have been mostly independent. They grew most of their own food, built their own home, chopped wood from their land for fuel and made their own clothes. The animals they used to work were fed from the products raised on the farm. This pioneer family may not have been quite as independent as the Indians, but they would still be rated as being independent by today's standards.
Family D	A modern farm family who raises grain only is almost entirely interdependent. This family gets the materials for their shelter from a lumber company. They wear clothes bought in a store and heat their homes with natural gas supplied by a utilities company. The grain they raise is sold. They receive money for their crop and use that money to buy the things they need. This family is very interdependent.

Part 5

Evaluating:

3. In the second part of this exercise, the children will look at the Needs Chart and decide how independent or interdependent their family is.

4. Divide the class into groups. Have each group choose a family they would like to analyse.

Have each group prepare a profile of their family?
- members
- where they live (urban or rural)
- occupation
- activities
- Does the family own any natural resource?

Have each group assess their family on the INDEPENDENCE CHART

Conclusion:

Have each group present their family to the class giving a description of the family and their evaluation as to how independent they are.

Ask each group to explain how their family might be able to become more independent.

* What conclusions can we draw from the lesson?

1. It is nearly impossible to be truly independent.
2. The most independent families have their own raw materials and supply their own basic needs.
3. Some families are more independent than others.
4. There are advantages to being independent, but there are also advantages to being interdependent.

For Discussion:

1. In the last 400 years, people in Alberta have been both independent and interdependent. In your opinion, will Albertans be more or less independent in the future?

2. What are some of the advantages to independence? Interdependence?

Related Activity:

1. Try to make your class totally independent for a day.

Worksheet

INDEPENDENCE CHART

	Always	Sometimes	Never
1. Grows own food in a garden			
2. Built own home from resources on your land			
3. Supply own Fuels from your own land (fire wood, coal)			
4. Make own clothes			
5. Work for yourself (not employed by another)			

What natural resources does your family own?

What natural resources does your family use?

- - - - - - - - - - - - -

Score
3 for each answer under always
2 for each answer under sometimes
1 for each answer under never

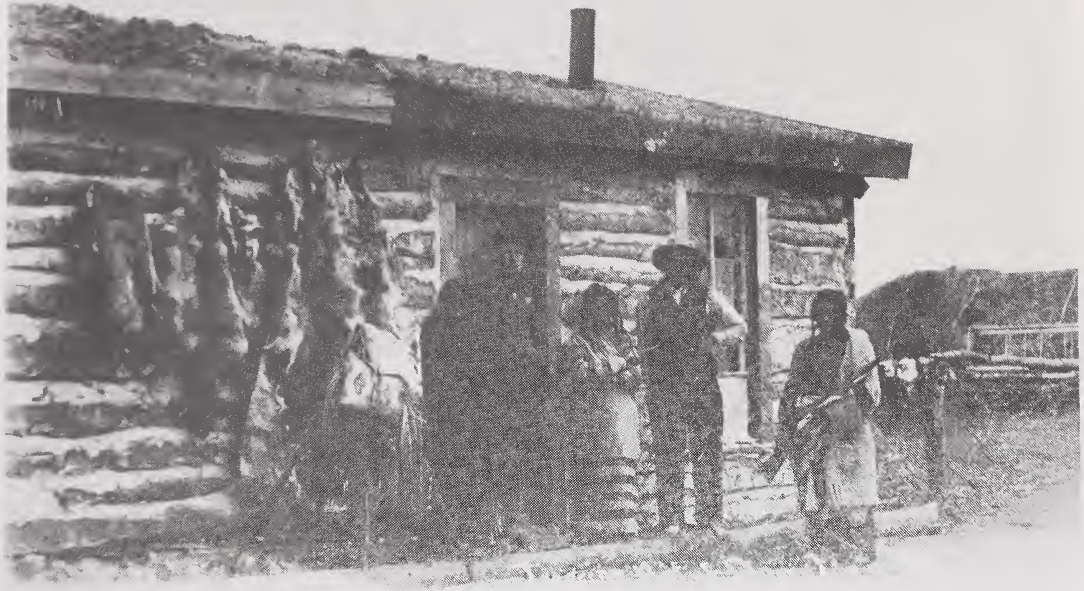
The higher the score, the more independent your family is in providing their own basic needs.

Prior to 1600 a.d. Plains Indians were very independent. Their needs being met almost completely by buffalo.

After 1600 a.d. Indians traded actively with European traders. This made them more interdependent.

Blackfoot Indian Camp. Fort MacLeod Area 1902, A11095
Provincial Archives of Alberta

Trading posts were centers of exchange



David Lambert Trading Post 1883. P3455.
Provincial Archives of Alberta

Trips to town were few and far between.

Whyte Avenue, Edmonton. 1901. A 2263
Provincial Archives of Alberta

This busy farm yard could meet most of the family's needs.

A characteristic Western Farm Yard. 1980. D720.
Provincial Archives of Alberta

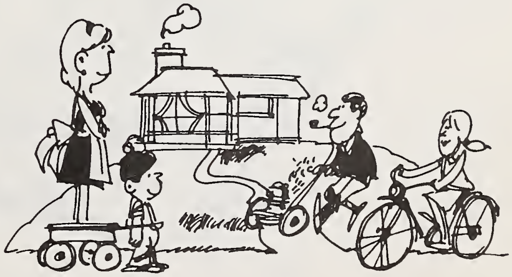
Alberta farmers may specialize in a one crop operation. These families are very interdependent.

A feed lot operator such as this may buy all of the feed for the animals. A custom feed lot fattens animals for several owners.

Lesson 17

FUTURE OF THE FAMILY FARM

Subject Area:	Language Arts. Grades 4 - 6
Curriculum Direction:	Development of Speaking Skills Express orally, explanations, preferences, feelings, judgements, emotions, predictions.
Secondary Subject Area:	Social Studies Alberta - Past, Present, Future - change
Lesson Concept:	By assuming the role of another person, we can better understand their feelings.
Purpose:	To show that different people feel differently about the same event. To express feelings and preferences orally. To improve decision making skills.
Materials Required:	- stage area (front of classroom) - some form of entrance to a stage area - table and chairs - cups - various other stage props such as drinks and costumes are optional Further Information - "Rural Population and Farm Sizes"
Time Required:	2 class periods.



PROCEDURE:

Part 1

Introduction:

This is a role playing activity where children are asked to portray a dilemma situation. It is a family problem which must be solved.

In the early years of Alberta's settlement, much of the population was rural. The homesteads were a parcel of land consisting of 160 acres. These were developed mainly as family farms. Thriving farmers bought more land as it became available in the district. The communities provided support and social opportunities for their members. The community activities were very important to farmers and their families.

Today most of Alberta's residents live in cities and towns. Families have moved from the farm to take jobs in the cities. The farms are much larger than they were 50 - 80 years ago.

Some of the modern farms are owned by large corporations. These farms are run on a co-op basis. An example of a co-op farm is a Hutterite Colony. This move towards larger farms and corporate holdings has resulted in sparse rural populations and reduced community activities. Many farming families are struggling to keep their communities alive during this transition.

Of course, there are a variety of opinions held regarding this shift from the small family farm to the larger operations. Often the people who are charged with making decisions find themselves in difficult positions. Many opinions are raised and quite a lot of pressure is applied by various interested parties.

Part 2:

Preparations:

1. Introduce the lesson by discussing the transition from rural to urban living in Alberta.

   a. What does this mean to farmers?
   b. How would this affect the community?

   As the farms get larger, the neighbours get more distant and there are fewer people to share in the community.

   c. Do any of the students have something in their homes that belonged to their grandparents? Usually these things are treasured by the family. These things become traditions. Things we treasure from the past are important and we resist change.

2. Explain to the students that they are going to share in the decision of a farmer of today.

3. Read the background of the Dilemma to the class.

4. Ask for student volunteers to act out the dilemma. There are 8 men and 5 women characters. The balance of the class will be the audience.

   Members of the audience will be asked to decide what they would do in the same circumstances.

5. Make copies of the roles and give each volunteer character his or her role. Ask them to study them for a few minutes. They may wish to ask questions in order to clarify their roles.

   Review all of the roles with the entire class.

6. The non-participating students can arrange the stage for the drama. There should be some kind of door to enter the kitchen. They may decide to make some sets, but these are not essential.

Part 3

The Dilemma:

1. In the next class period, the stage will be set.
2. Explain the order that the characters will arrive at the kitchen. If possible, have the characters wait outside the classroom so they will not be influenced by what happens before them. The characters should avoid discussing their views with each other before the role playing.
3. Invite the participants to begin the drama.

Conclusion:

When Henry has made his decision, ask members of the audience to comment on his choice. How many would have made the same decision?

For Discussion:

1. Who had the strongest argument?
2. What would happen if Henry decided to sell:

   a) through an agent?
   b) to the German Corporation?
   c) to the Hutterites?

Related Activity:

Choose a farming area and look at the county map to see who owns the land and how it is divided.

THE DILEMMA

Background:

Henry Johnston is a farmer who has been living in the Josephberg Area all of his life. His parents came to Canada in 1911 and homesteaded on Henry's farm. Henry and his father worked hard at their business and bought three more quarters of land. Henry now owns 4 quarters (a section) and has a very successful grain farm. Henry and his wife Sally are very well loved by their neighbours. They have been very active in the community.

Henry is now 66 years old. His son Bill is a veterinarian and lives in town. Bill is a bachelor. He does not want to farm, but he understands that his father and mother should soon retire from the business. The family decides that they must sell the farm. This is a very difficult decision because it has been in the family for so long.

The problems do not end here. What Henry must decide is who to sell the farm to. Many groups are putting pressure on Henry and Sally since they have opinions as to what they would like to see happen to the farm.

Characters and their views:

1.	Henry	the farmer - has decided he must sell his farm. He values his friends in the community and plans to move into the town of Josephberg where he and his wife can continue to take part in community activities. Henry really hates to leave the farm.
2.	Sally	the farm wife - has lived in the community all her life. She is very active in the community and belongs to an association to support farm families. She believes that farms are wonderful places for families to live and wants to find a family to buy the farm.
3.	Bill	the son - Bill is a bachelor. He is very interested in agriculture and has become a Veterinarian. He lives in town because his hours are so variable that he would find living in the country very difficult. Bill has a client in the area who manages a large corporate farm which is owned by a Count in Germany. He feels his family should sell their land to the corporate farm. The price is good and he feels it would also be good for his business.
4.	Felix	the manager of the German corporate farm. Felix's boss has authorized him to offer to buy Henry's farm. He is offering a fair price and will buy the machinery as well. Felix wants an answer in the near future because his boss is coming for a visit from Germany in two months and the final arrangements could be made at that time.

He has asked Bill to talk to Henry and Sally on his behalf. He plans to pay them a visit even though he does not know them. He is not very active in the community.

5. John and Peter are senior members of the local Hutterite colony. The colony has been given the approval to expand. They are anxious to buy Henry's farm because they hold land next to it. The Hutterites are excellent farmers and will pay cash for the land. They have offered the best price for the land so far. The members of the Hutterite colony keep mostly to themselves. They do not participate in the community except to sell some of their produce at the local farmer's market.

5. Norman, Lester & Fred are neighbours who own family farms in the district. Due to several difficult years, these neighbours are not able to buy Henry's farm, but they hope that the farm will be sold to a family, not to the corporation or the colony. These farmers are like Henry and Sally. They believe that family farms are good. The neighbours want Henry to advertise his farm and sell it to a family which would help to keep the community active.

If Henry tried to sell his farm this way, he would have to hire a Real Estate Agent and pay a fee.

6. Nancy, Gwen, Lorna & Jane neighbours, and friends of Sally. These ladies would like Sally to suggest to Henry that he hire a Real Estate Agent. They are worried that the community will not be active if the farmland is all bought out by large business. These neighbours meet with Sally for coffee and share their ideas with their friend.

The Setting:

The Johnston Kitchen

Order of events:

1. John and Peter from the Hutterite colony come to visit to make their offer. (exit)

2. Bill comes to visit and brings Felix to discuss selling to the German corporation. (exit)

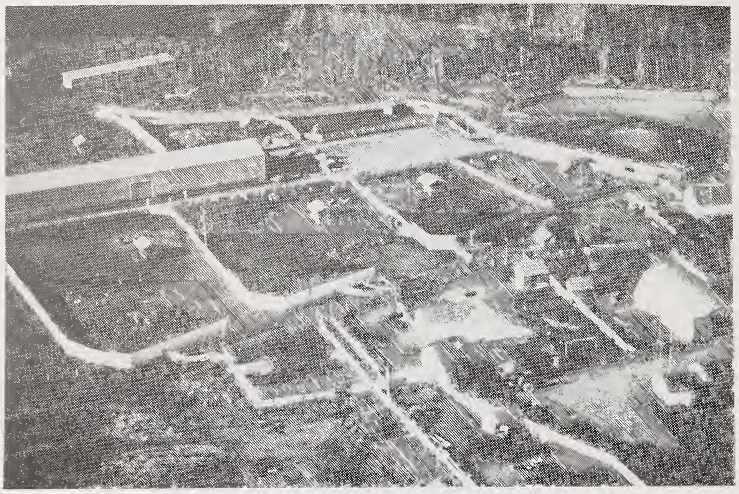
3. Norman, Lester and Fred drop in and suggest that Henry hire a Real Estate Agent and try to sell to a family. (exit)

4. Nancy, Gwen, Lorna and Jane visit Sally to work on some sewing. They discuss the community and try to persuade Sally to ask Henry to hire an agent and sell to a family.

5. Henry, Sally and Bill have a meeting and decide the future of the farm.

   Remember the final decision is Henry's.

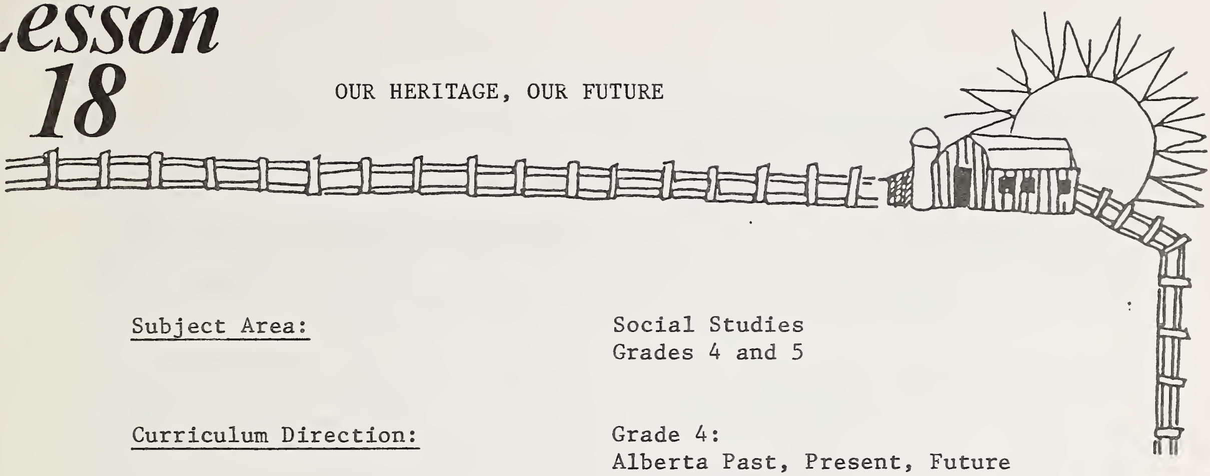
Some large farming operations are owned by corporations.



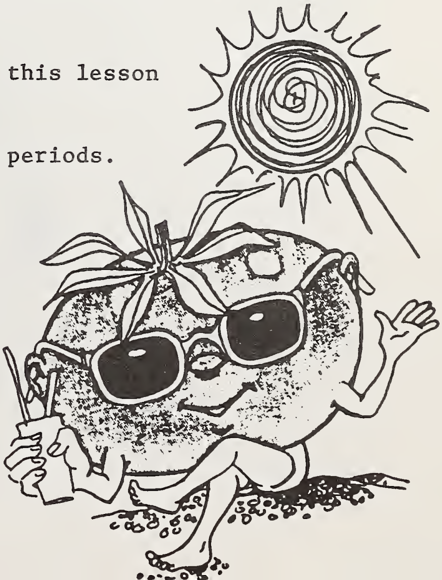
A family farm is a good place to live.

Lesson 18

OUR HERITAGE, OUR FUTURE



Subject Area:	Social Studies Grades 4 and 5
Curriculum Direction:	Grade 4: Alberta Past, Present, Future - Technology Grade 5: Canada Industrial Development from Region to Region - Industry, standard of living, employment
Lesson Concepts:	1. Some things are constantly changing. Some things remain the same. Both of these may be related to the same industry. 2. In agriculture, we have been producing essentially the same products for many years, however the technology used in management and production is ever changing.
Purpose:	To learn how technology has changed man's activities on the farm. To speculate how agricultural technology may change in the future.
Materials Required:	Supplied in this lesson
Time Required:	1 - 2 Class periods.



PROCEDURE:

Part 1

Introduction:

Review the concepts of change and constancy. They are opposite. How can both of these concepts be applied to the same activity?

Example: Heat is required for cooking. The requirement of heat is constant, while the source of the heat may vary greatly. We may not even know what some of the sources of heat will be in the future.

In this lesson, we will look at two ordinary food products that we are all familiar with and eat often. We will see how the technology used in the production of these foods has changed, and we will see if we can predict some of the changes we may expect to find in the technology in the future.

Part 2

Collecting Facts:

1. The class may be divided in half. One group would investigate Egg Production and the other Milk Production.

2. Show the class the pictures of the old methods employed in each operation. Ask them to suggest other things they know about Egg and Milk Production 75 years ago.

3. Show the class the pictures of the modern technology used in both of these operations. Discuss how things have changed.

Part 3

Making Predictions:

4. Ask each group to imagine how these operations may change even more over the next 75 years. Assuming that we would still be enjoying eggs and milk, what might change on the part of the farmer.

5. Have each individual or group draw a picture or make a model of a dairy or egg production operation of the future.

Conclusion:

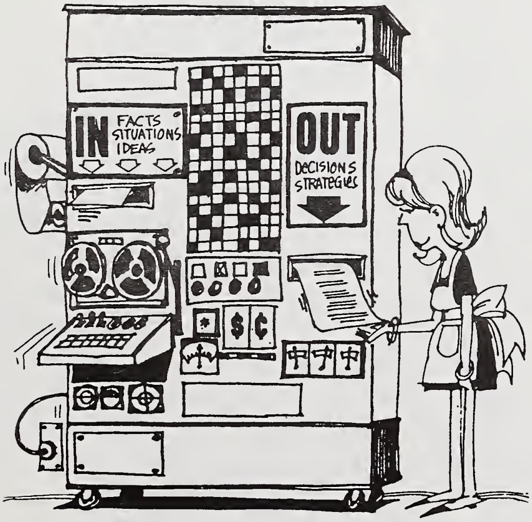
Explain or Demonstrate your technology of the future to the class.

For Discussion:

1. What sources of power will be used in the future?
2. How will the ratio of product to man hours change?
3. Will artificial substitutes ever be used in place of these two food items?

Related Activities:

1. Choose another industry and find out how its' technology has changed.
2. Compare the advances in agriculture technology to the auto industry.
3. Tour a modern Dairy or Poultry farm.



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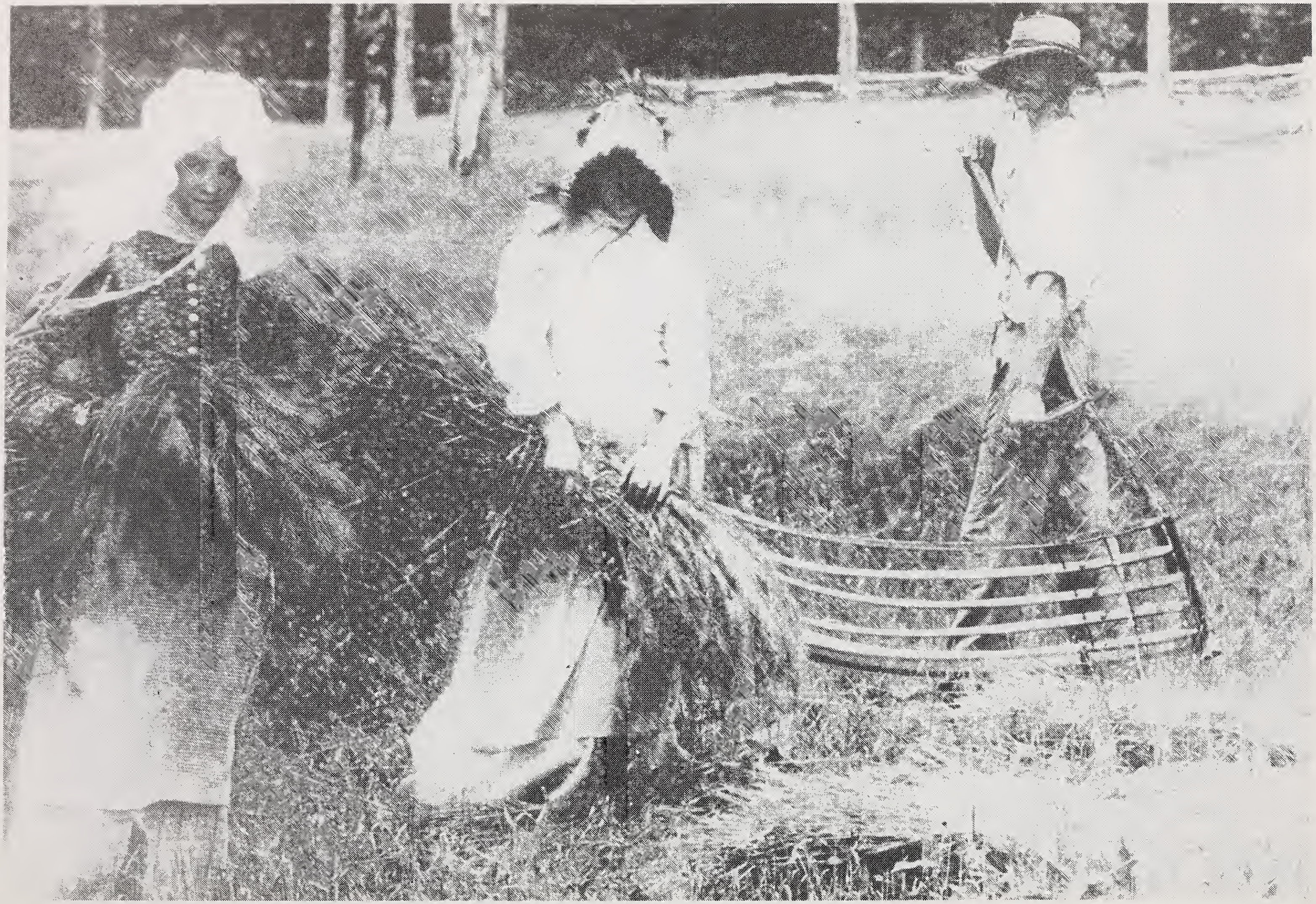

Cradle - Early Harvesting. 1906 A1615
Provincial Archives of Alberta

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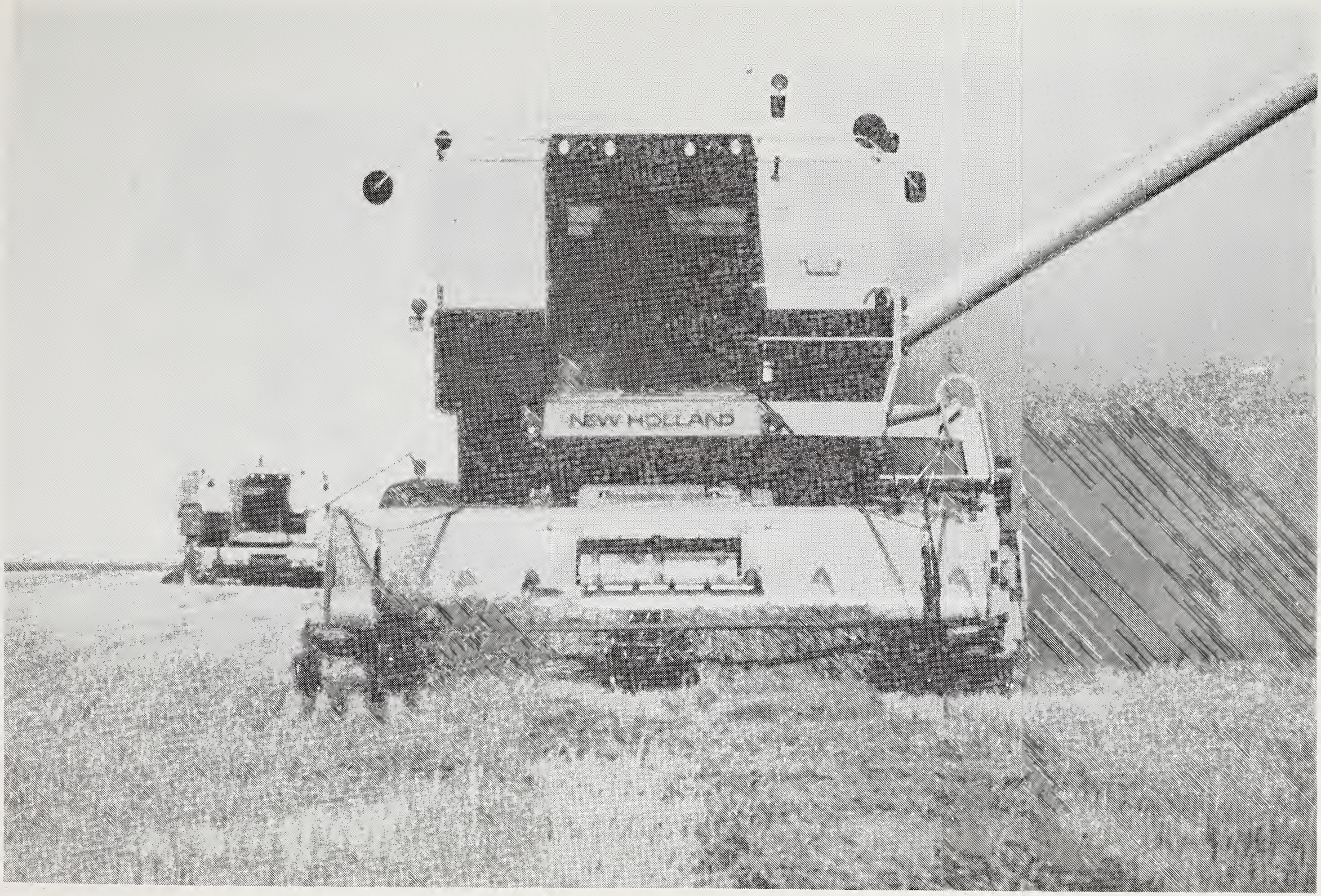

Modern Harvesting

THEN

Hand milking

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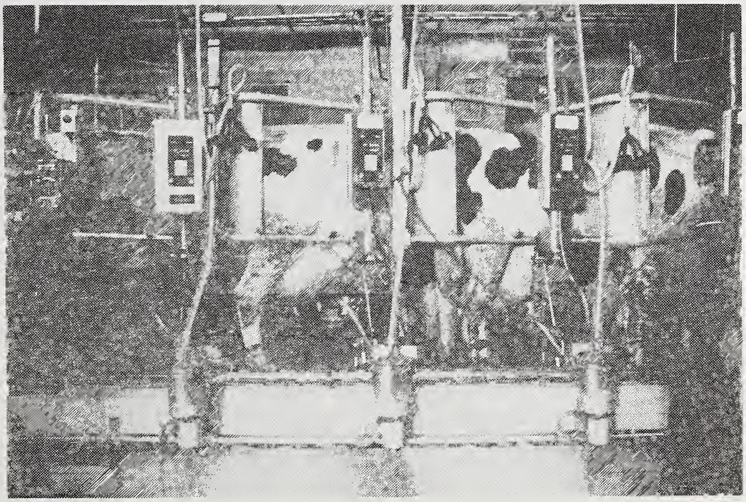
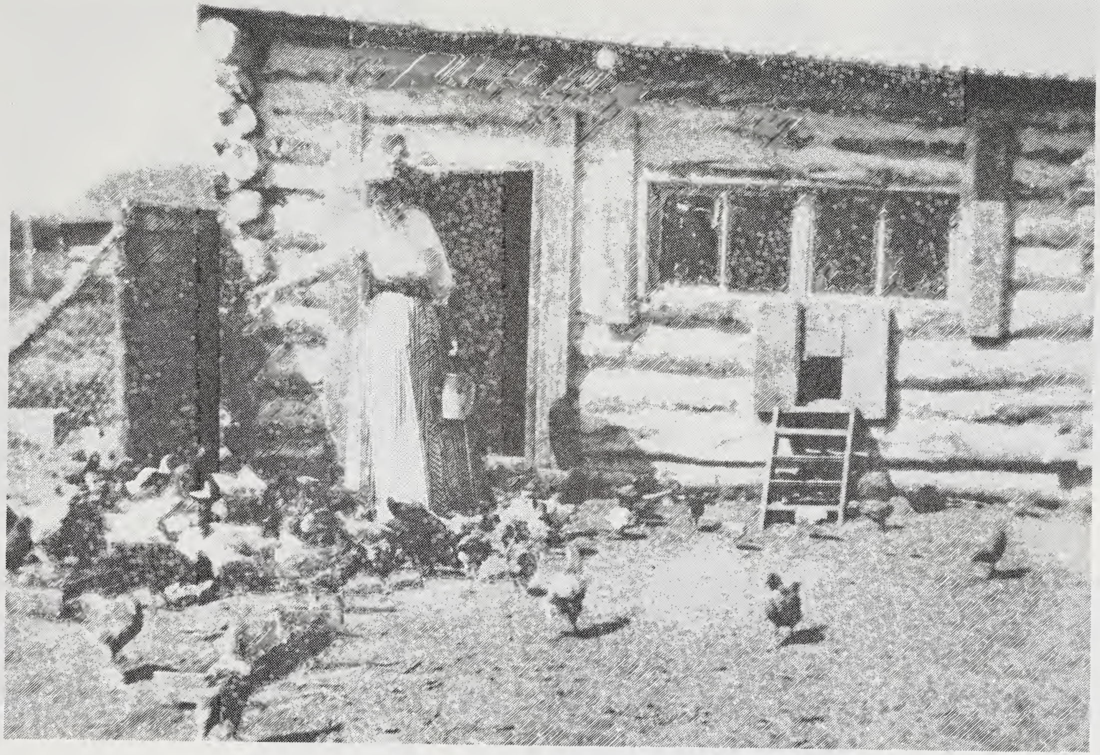


Modern Milking Parlour

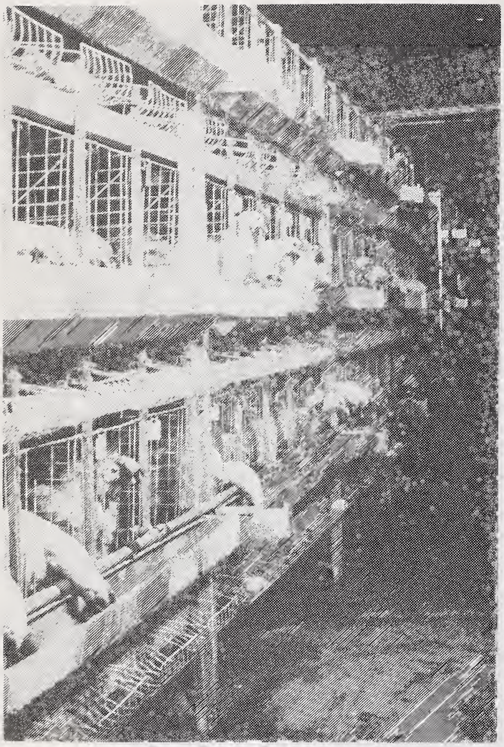
Changes in Egg Production

THEN

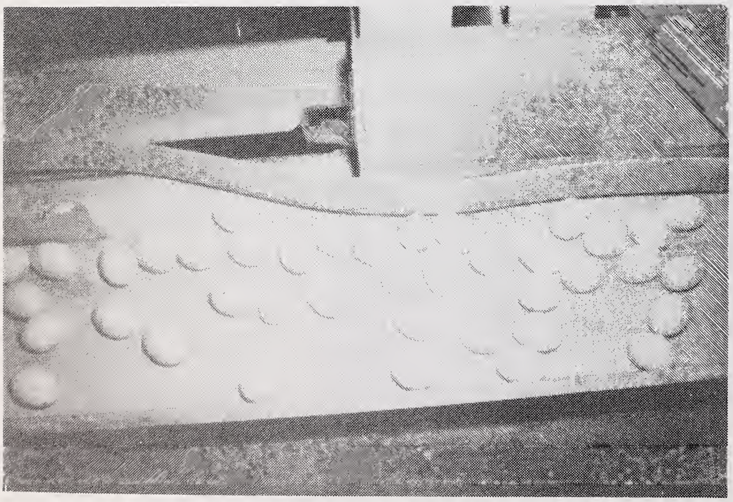


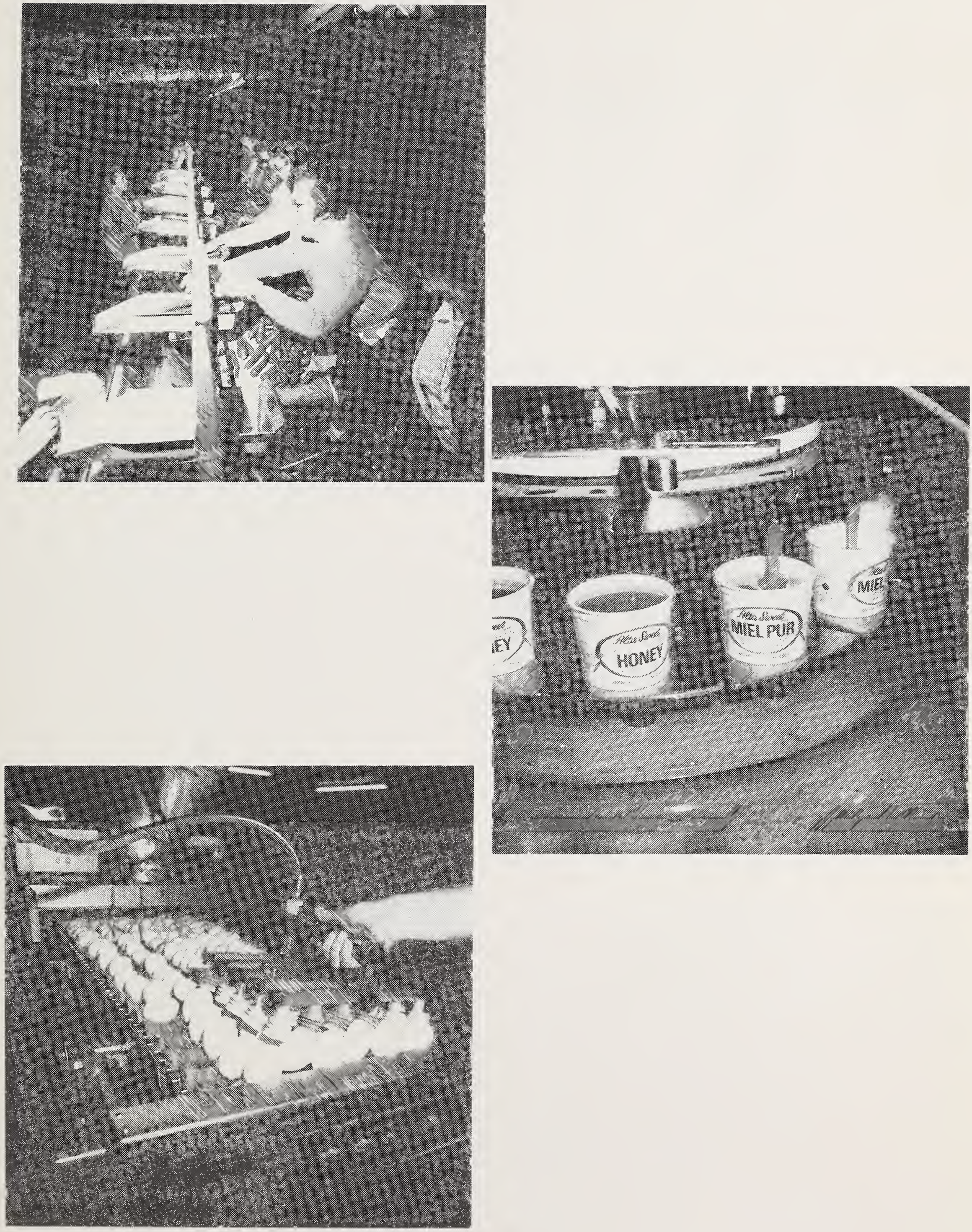
Chicken Coop. Villeneuve 1907. A 7693
Provincial Archives of Alberta

NOW



Laying hens are kept in small pens. The eggs roll out on to the conveyor belt.





Food Processing.
The teamwork of people and technology.

Lesson 19

INTERNATIONAL SUPPER

Subject:	Social Studies
Curriculum Direction:	Alberta's Links with Canada and the World.
Lesson Concepts:	Food products are one of Alberta's major trade items. A meal can be an international food experience. Food imports supply the variety in our menus.
Purpose:	To understand how each of us is dependent on Alberta's relations with Canada and the World. To improve the skills of selecting and grouping.
Materials Required:	- Worksheet in this lesson - Art supplies - Food product labels.

PROCEDURE:

Part 1

Introduction:

The food we eat comes from a variety of sources. Some is raised right here in Alberta. Some comes from as far away as Australia, and South America. Food products make up a large percentage of Alberta's trade.

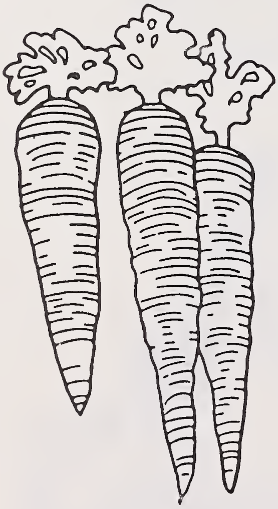
Food also comes to us in many different forms. Some, such as lettuce, potatoes, and other fresh vegetables, are marketed in a natural state. These require very little processing. Some food products are extensively refined and processed before we eat them. Sugar beets and canola are two good examples of extensive processing.

This lesson presents the students with the problem of finding the origin of their food. They will discover some of the food processing plants that are located in their province. Alberta's relationships with other food producing countries of the world is essential for us to enjoy the variety of food on our tables.

Part 2

Research:

1. Introduce the class to the menu included in this lesson. What is a menu?
2. Explain the work sheet.
3. Have the students complete the worksheet.
4. As a class or in groups, develop a menu that the class would like to evaluate.
5. Write out the main ingredients that are included in the menu.
6. Have each student choose a different ingredient.
7. The assignment. Find the ingredient at home or in a store and make a copy of the label.
8. As a class, using the work sheet as a guide, evaluate the ingredients and list them under their various groups.
9. Have each child design a label for their ingredient.



Conclusion: Make a large display of the Menu and a collage of the children's labels.

For Discussion:

1. How does the season affect the number of processed and imported foods that we eat?
2. What would we eat if we were limited to all Alberta products?
3. What are the advantages of importing food?

Related Activities:

1. Prepare a week's menu using only Alberta Products.
2. Make a large map of Alberta and show the places where food is processed. Sample map included in this lesson.
3. Visit a food processing plant in your region.

MENU

Fresh Vegetable Salad and Dressing

Roast Chicken

Fried Green Beans and Mushrooms

Scalloped Potatoes

Apple Pie

Milk

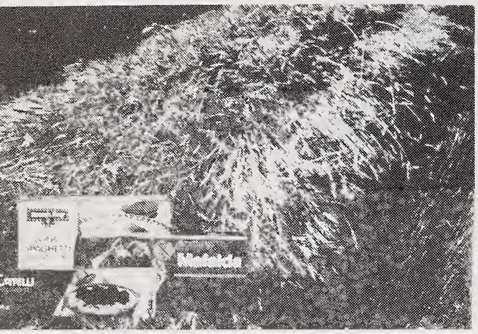
Tea or Coffee

PRODUCT ANALYSIS

Make a check under each of the factors which describe each of the listed ingredients.

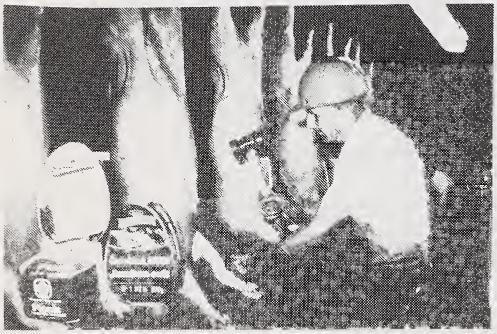
The first ingredient is done for you.

INGREDIENT	ALBERTA PRODUCT	IMPORTED PRODUCT	REQUIRES LIMITED PROCESSING	REQUIRES EXTENSIVE PROCESSING	PROCESSED IN ALBERTA
Chicken	X		X		X
Bread cubes					
Onion					
Celery					
Spices					
Brans					
Mushrooms					
Cream					
Flour					
Potatoes					
Margarine					
Lettuce					
Tomatoes					
Green Onions					
Canola Oil					
Vinegar					
Fresh Apples					
Sugar					
Lemon Juice					
Milk					
Coffee					



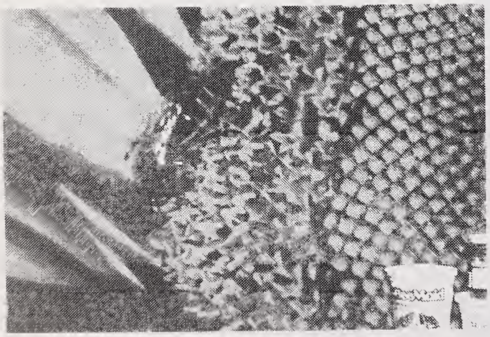
Wheat

Wheat

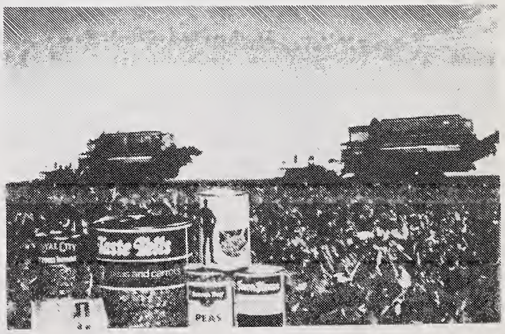


Hogs

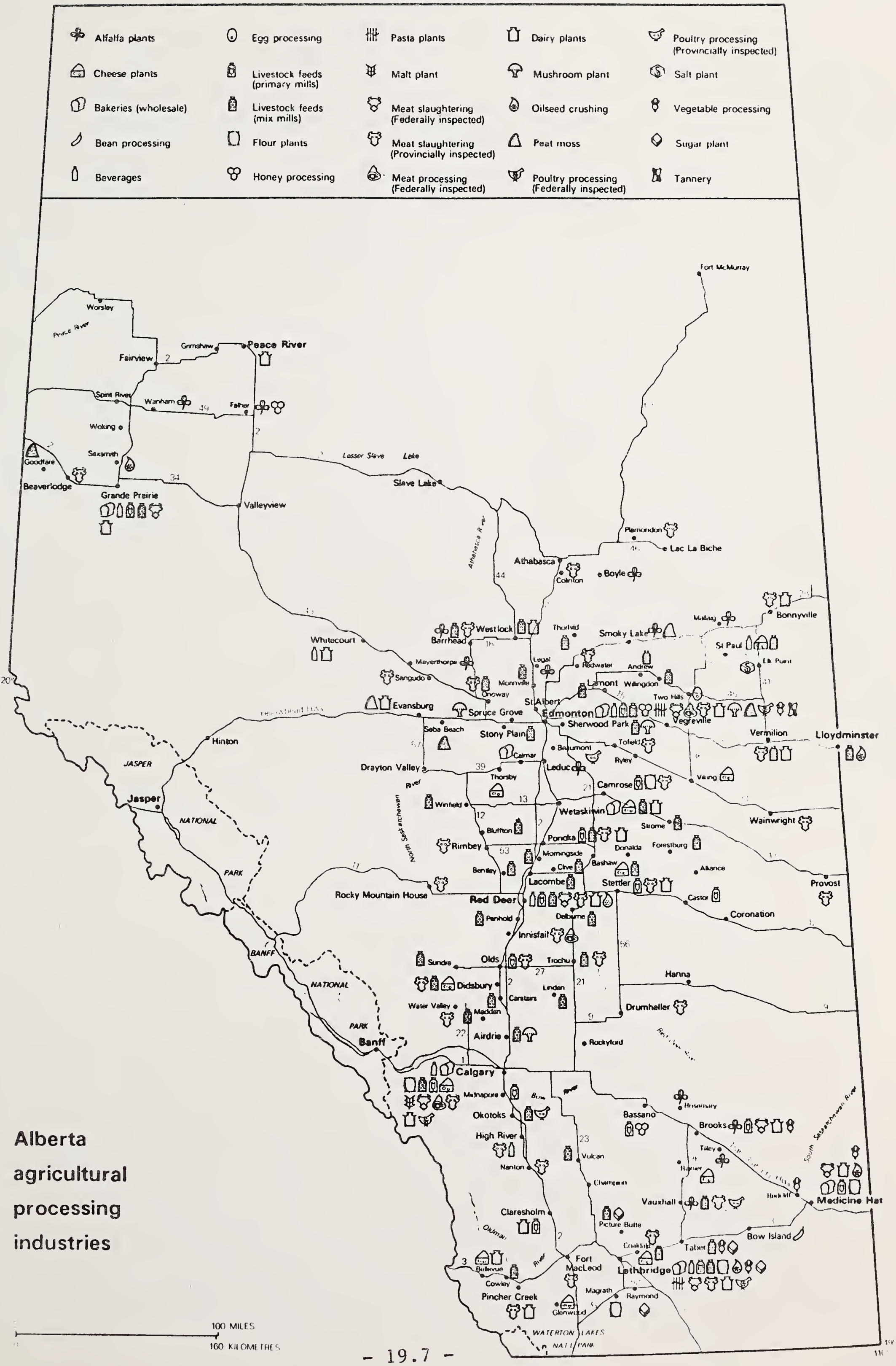
Dairy Cattle



Honey Bees



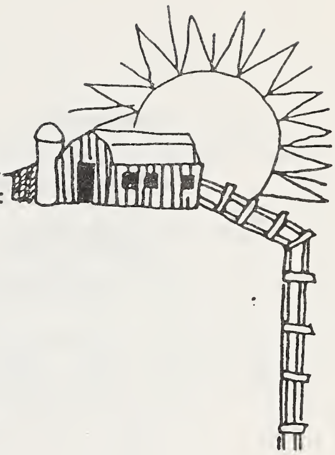
Row crop gardens



Alberta
agricultural
processing
industries

Lesson 20

AGRICULTURE IN THE NEWS



Subject Area: Language Arts

Curriculum Direction: Reading for Information

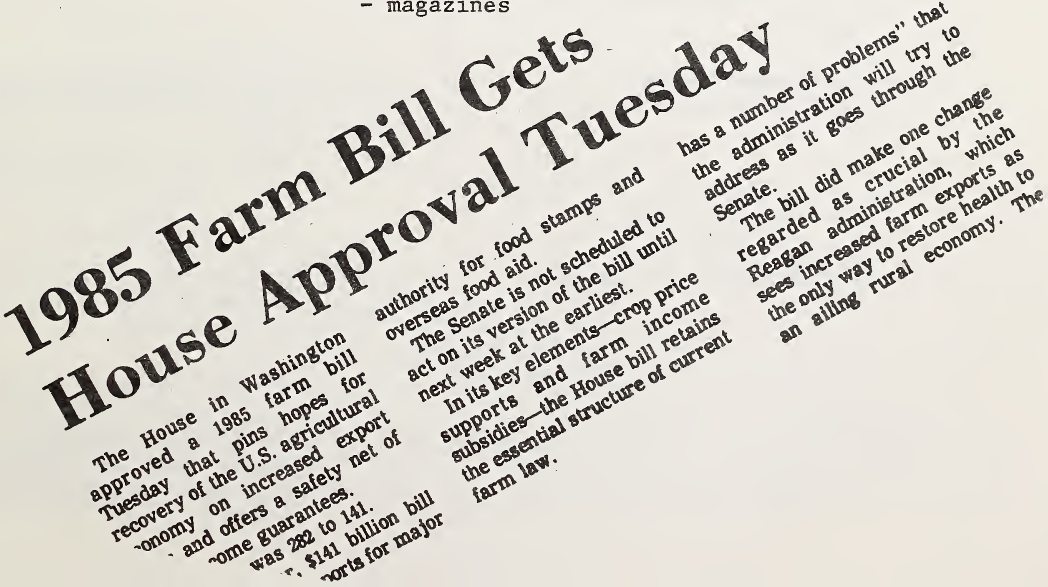
Secondary Subject Area: Social Studies

Curriculum Direction: Alberta Links with Canada and the World

Lesson Concept: Newspapers provide us with a connection to the outside World.
- Agriculture has a voice in the media.
- The concerns of Agriculture are both local and international.

Purpose:
- to practice reading for information
- to develop research skills
- to practice organizational skills
- to learn some new facts about Alberta Agriculture.

Materials Required:
- 18" x 24" art paper
- newspapers and current events
- magazines



1985 Farm Bill Gets House Approval Tuesday

The House in Washington approved a 1985 farm bill Tuesday that pins hopes for recovery of the U.S. agricultural onomy on increased export and offers a safety net of ome guarantees. was 282 to 141. , $141 billion bill orts for major authority for food stamps and overseas food aid.

The Senate is not scheduled to act on its version of the bill until next week at the earliest.

In its key elements—crop price supports and farm income subsidies—the House bill retains the essential structure of current farm law.

has a number of problems" that the administration will try to address as it goes through the Senate.

The bill did make one change regarded as crucial by the Reagan administration, which sees increased farm exports as the only way to restore health to an ailing rural economy. The

PROCEDURE:

Part 1

Introduction:

This Activity would be best done in the Spring or Fall season.

For most us of, the major information source is the media. Newspapers, T.V. , and radio carry news stories that are either of interest to their audience or directly affect their audience. Often what we learn from the news makes up most of what we know about the subject. While we are aware that this is not the complete story, it is at least a good place to start.

This activity can be used to develop students' collection and organizational skills while learning some things about the business of agriculture.

Part 2

Discussion:

1. Discuss some of the information sources that help us to keep up with the current events. Students may suggest the following sources: newspapers, magazines, T.V., and radio.

   Show the students an example of a newspaper item (preferably one related to Agriculture).

   Ask the class what facts they can learn from the article.

Part 3

Construction:

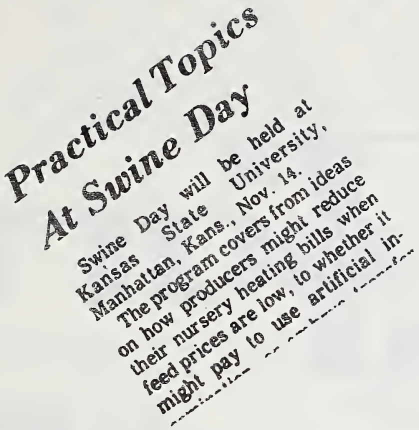
2. Have the students make a scrap-book from 18" X 24" art paper (folded in half). It should contain about 6 pages. (3 pieces of paper.)

Part 4

Collecting & Grouping:

3. Each student will be asked to look for news items which are related to Agriculture.

4. Ask the class to suggest some topics that might be covered. Like the effects of weather, product prices, new developments, government policies, national and international events.



Practical Topics At Swine Day

Swine Day will be held at Kansas State University, Manhattan, Kans., Nov. 14. The program covers from ideas on how producers might reduce their nursery heating bills when feed prices are low, to whether it might pay to use artificial in-

5. Choose 4 or 5 major topic areas and write them on the inside cover of the scrap books.

   Have the students decorate the front page of their scrap book with a drawing or picture.

6. The project should continue for about 6 weeks. Each student should collect a minimum of one news item per week.

7. At the end of the designated time, have the students organize the articles in their scrap books under the various topics they discussed and paste their news items into their books.

Conclusion:

1. Have the students decide what was the major concern for agriculture during this period.

2. Have each student write 3 new facts they learned about Agriculture on the last page of their scrap books. These facts may be taken from information collected by all students in the class or from their own articles.

For Discussion:

1. Did the season have anything to do with the news related to agriculture?

2. Was agriculture an important news item?

Related Activity:

1. As a class, write a news story about an agricultural event.

well, Bank that con-

-bid sale was a from the land bank's nal method of selling land real estate agents. bank accepted bids on 15 totaling about 8,000 acres orthwest counties. ell said some bids were what the bank had wanted. bidders also will have to increase their of

tal

expects all sales to be final next week.

"We didn't total up the bids or have a set figure," he said. "We were trying to sell the property. We will sell a majority of it.

"Nearly all the bids came from local farmers. Only three w out of our area, but eve were farmers."

The bank started but two were s The 17 par farmer de

extension and and new statutory

Conference For Japan and North Carolina

A total of 38 Japanese com panies have establishment North Carolina, says Da of N. C. State Unive conference to economic tie North C Rale

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union farm

In Union Is Strength

Volume 36, Number 8 Second Class Mail - Registrat

L DEC 9
ALBERTA AGRICULTURE
EDMONTON, ALBERTA

Ontario farmers rally to demand action on the crisis

By BEVERLY BERNARDO
Special to the Union Farmer

THOMAS, Ont.— Ap ximately 1000 farmers rallied e November 9 to demand the nstatement of the Farmers' ditors Arrangements Act used the 1930s depression and a ratorium on all farm eclosures.

he crisis facing family farmers an estimated 23 percent of ily farms are in economic dif lty — has produced an un cedented unity among farm anizations in Ontario. The test action was called by the ison Committee of Ontario rm Organizations which is composed of the following groups: The tional Farmers Union (NFU), nadian Farm Survival sociation, the Ontario deration of Agriculture, Women the Survival of Agri ncerned Far holic Rura d the Ch sociation.

armers from io — Bruce Co

by banks.

Hank Chromezak, a tobacco grower from Brownsville, explained that the growing unity between farmers is coming about because "Farmers, whatever we may produce, are facing exactly the same situation. We all need to meet the cost of production."

Maria Van Bummel from Concerned Farm Women chaired the rally. The main speaker at the rally was John Langlois, chairman of the Liaison Committee of Farm Organizations. Langlois began his speech by proposing 30 seconds of silence for those who had lost their farms, in order to recognize what farm organizations have accomplished, "but also what we h failed to do."

Langlois "Far

A.M.R.
FAR BEFOR BAN
farmers neglected only in Canada
THIS GOVT BAIL OUT BANK WHY NOT HELP TH HAND THAT FEEDS THEM

Approximately 1000 farmers rallied in S to protest feder

take up

r own morat sures if the t by Novemb rs they nee ers in thei e system. rop every assets Irelan se tim

Trusty farmers clobbered hard

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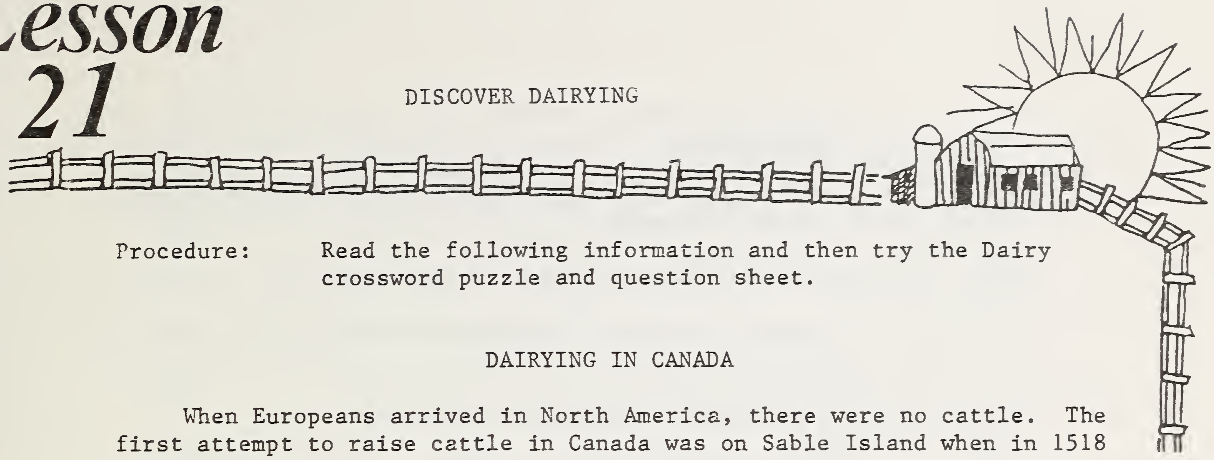
Dealer default victimizes family, page 3

Independent

Lessons

Lesson 21

DISCOVER DAIRYING



Procedure: Read the following information and then try the Dairy crossword puzzle and question sheet.

DAIRYING IN CANADA

When Europeans arrived in North America, there were no cattle. The first attempt to raise cattle in Canada was on Sable Island when in 1518 Baron DeLery tried to colonize the island. The herd was abandoned when the colony failed. There were cattle on the island until 1630 when they were killed by Puritans from Massachusetts. Imports in 1541 and 1598 failed when the cattle were all slaughtered for food.

The first successful herd was brought to Lower Canada by Champlain in 1608 or 1610. Other colonists also brought cattle. Dutch colonists brought 103 head of cattle in 1625 (likely Fresians). Puritans from the United States also brought cattle.

As the settlers moved west, they took their cattle. By 1846 there were 70 cow dairy herds near Victoria, B.C.

Early dairying was done on a small scale with families producing enough milk, cheese and butter to meet their own needs. It is interesting that Canada was exporting dairy products as early as 1764.

Todays industry has grown from its small beginnings. The following developments contributed to the dairy industry in Canada and Alberta.

CANADIAN DAIRY HISTORY

1518	Cattle brought to Canada (Sable Island)
1660 - 65	Dairy cattle brought to Quebec from Normandy and Brittany.
1764	Cheese exported from Nova Scotia
1821	The Ayrshire is introduced to Canada from West Scotland.
1825	The Shorthorn is introduced to Canada from the United States.
1850	Jersey introduced to Canada from England (Royal Herd).
1856	Gail Borden receives the first patent for condensed milk, U.S.A.
1856	Louis Pasteur begins experiments that lead to a process called pasteurization.

1857	First successful condensed milk plant built by Borden in Conneticut.
1864	The first cheese plant built in Canada opens in North Norwich, Ontario.
1867	Ontario Dairymen's Association is formed.
1870	Ayrshire Breeders and Importers Association formed in Quebec and eastern Ontario.
1872	Dominion Ayrshire Breeders formed.
1873	Canada's first creamery opened at Helena, Quebec.
1878	Guernsey cattle introduced to Canada from the Channel Isles.
1881	Milk and cream separated by centrifuge.
1881	Holstein-Fresian cattle introduced to Canada from the United States.
1883	First major exhibit of dairy cattle in Canada (Toronto).
1883	First condensed milk made in Canada at Truro, Nova Scotia.
1884	The Canadian Holstein Association is formed.
1886	Dominion Shorthorn Breeders Association is formed.
1890	The Dairy Branch of the Canadian Department of Agriculture is formed.
1880	Stephan Babcock develops a simple test for butterfat.
1891	Stephan Babcock's butterfat test is introduced to Canada.
1893	A dairy program is established at the Ontario Agricultural College at Guelph.
1893	Ontario cheese makers made a 10-ton (103,000 liter) cheddar for the Chicago World Fair. Record held for size until 1964.
1894	Canadian Jersey Association formed.
1895	First commercial machines for pasteurization used.
1897	Cheese factories and creameries must be registered.
1898	Canadian Ayrshire Breeders Association formed from the previous associations.
1898	Cheese and Butter Makers Association formed in Ontario.

1903	Alexander Gillies of Australia assembles the first modern milking machine.
1904	The first commercial dried milk is produced in Canada.
1905	ROP test for 365 day lactations introduced.
1905	Canadian Guernsey Breeders Association formed.
1907	Assistance from the Federal Department of Agriculture in developing cold storage assists the dairy industry.
1908	First Holstein issued ROP Certificate.
1914	All dairy cattle must be tested for tuberculosis.
1919	Regulation approved to establish and maintain tuberculosis free herds.
1920	ROP test for 305 day lactation.
1921	Dairy Produce Act, grading of dairy products.
1922	Dairy classes at the Toronto Royal Fair offered 15 classes for Ayrshire, Guernsey, Holstein and Jersey.
1923	Importation and manufacture of margarine banned.
1923	Restricted Area Plan to control tuberculosis.
1930s	Public Utilities Act controlled the fluid milk sales.
1939	Cheese and Cheese Factory Improvement Act, to promote quality cheese production.
1947	Dairy Products displayed at the Toronto Royal Fair.
1948	Ultra-high temperature pasteurization of milk introduced.
1948	The section of the Dairy Act banning the sale of margarine was lifted.
1952	Canada Dairy Products Act.
1955	Purebred cattle blood typed.
1955	Flavour control equipment for milk introduced commercially.
1957	Brucellosis control program.
1966	Dairy Commission Act, to stabilize the industry.
1967	Non-dairy substitute introduced to the market.

ALBERTA DAIRY HISTORY

1890	First Alberta butter at Big Hill Springs (north of Cochrane).
1890 - 94	Cheese plants at Cardston, Springbank, St. Albert, Poplar Lake, and Ft. Saskatchewan.
1894	Butter and cheese factory in Innisfail.
1906	Dairy Branch of Alberta Agriculture.
1907	Butter grading in Alberta.
1906	Pasteurizing and bottling equipment in Edmonton.
1919	Alberta Dairymen's Association formed.
1921	Department of Dairying established at the University of Alberta.
1922	Milk buying stations abolished.
1923	Federal produce grading service graded butter and cheese.
1924	Central Alberta Dairy Pool formed.
1926	Instruction on Dairy Cattle Judging at the Vegreville Exhibition Boys Camp.
1927	Boys' and Girls' Dairy Calf Club organized at Lethbridge
1928	Northern Alberta Dairy Pool formed.
1931	Calgary Milk Producers Co-operative.
1934	Alberta Milk Producers Co-operative.
1955	First farm bulk milk tank installed in the Lethbridge area.
1956	First bulk milk hauling truck.
1962	Safeway opened the first "all ice cream" plant in Edmonton.
1962	Evaporated milk plant in Wetaskiwin (Carnation).

Recent developments in storage and processing have increased the popularity of milk products. Pasteurization was the main factor in the increase in milk consumption. This meant that everyone could have clean, healthy milk.

Once milk products could be stored, the variety of milk products in the daily diet increased. In addition to milk, cheese and butter; soft cheese, yogurt and ice cream became a regular part of the daily diet. Many of these foods had not been common because they could not be stored.

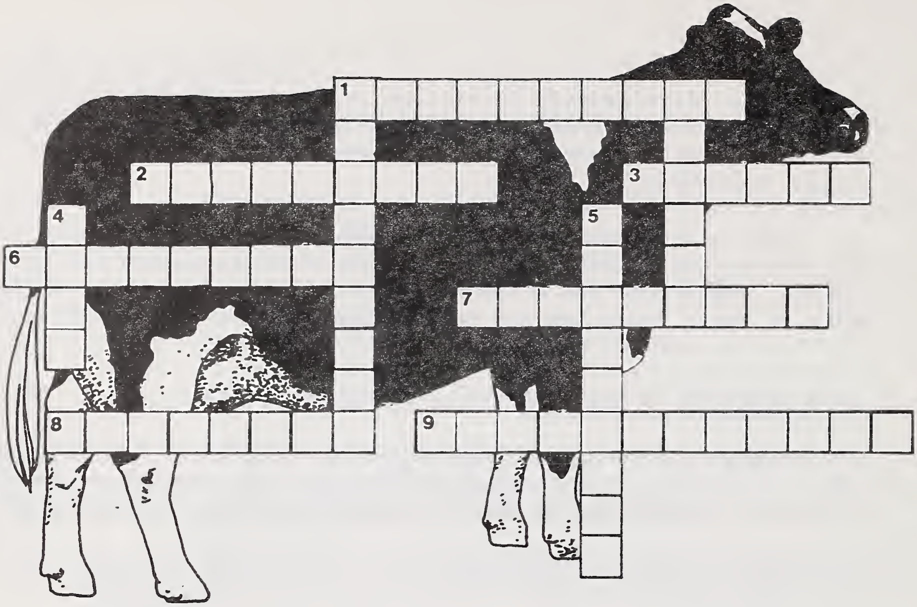
MILK PRODUCTS IN OUR DIET

Products from cows - meat and milk - are part of a balanced daily diet. According to the Canada Food Guide, you should eat the following selection of foods every day to supply all of the necessary nutrients.

1.	Milk (or Dairy Products)	3-4 servings
2.	Meat, fish, poultry, or alternates	2 servings
3.	Vegetables and fruit	4-5 servings
4.	Bread and cereals	3-5 servings

Milk is one of our most valuable foods. Not only can we use all of its protein, but it is one of the best sources of calcium, vitamin D and B vitamins. Without milk, it is almost impossible to get enough calcium. This is important, because calcium is necessary for strong bones and teeth. Because body cells are being replaced constantly, you always need calcium.

As people become fitness conscious, they begin to reduce the number of calories they eat and drink each day. Milk is often reduced in the diet when this happens. It is not necessary. While whole milk has 160 calories per 250 ml, lower calorie milk products such as 2% milk (145 calories), skim milk (90 calories) and buttermilk (90 calories) can be used instead. Remember, milk can be combined to make other flavourful foods such as puddings, cream soups, sauces and cheese. If you do not like the flavour, milk comes in so many forms that you should find several that you like.



Across

1. Milk and cream were separated by ____________________ in 1881.

2. Stephen Babcock developed a test for ________________.

3. The first _____________ cows in Canada came from Britain's Royal Herd.

6. The first modern milking machine was built in ________________.

7. In 1948 _____________ temperature pasteurization of milk was introduced.

8. The first _______________ was imported to Canada in 1881.

9. The first disease to be contolled in dairy herds.

Down

1. _______________ built an evaporated milk plant in Wetaskiwin.

4. The first farm __________________ milk tank was installed near Lethbridge.

5. In 1923 the import and manufacture of __________ was banned.

QUESTIONS:

1. What process made it possible for everyone to have clean, healthy milk?

2. If you did not have a refrigerator, what milk products would you not have?

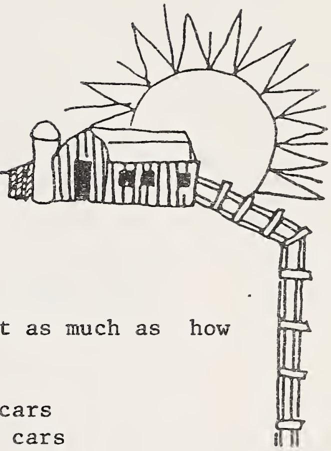
3. How many servings of milk should you eat or drink each day?

4. What nutrients does milk supply you with?

5. What are three foods you like that have milk in them?

Lesson 22

FUN FACTS



1. A large tractor used on an Alberta farm may cost as much as how many small cars?

    a) 50 small cars
    b) 3 small cars
    c) 5 small cars
    d) 15 small cars

2. One acre of land is about the same size as a ________.

    a) large swimming pool
    b) hockey rink
    c) football field
    d) tennis court

3. A single chicken lays how many eggs per year?

    a) 300
    b) 150
    c) 420
    d) 240

4. Alberta's major export cereal crop is?

    a) Wheat
    b) Oats
    c) Barley
    d) Canola

5. The Average 1 year old sheep will produce how many kilos of wool per year?

    a) 10 kilos
    b) 3.5 kilos
    c) 2 kilos
    d) 8 kilos

Key on page 24.2

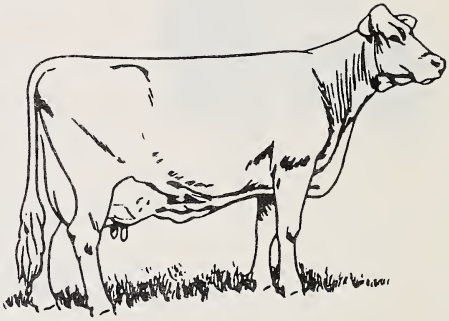
FUN FACTS

6. One beehive can produce how much honey in a season?

   a) 10 kilos
   b) 300 kilos
   c) 25 kilos
   d) 75 kilos

7. One dairy cow produces how many kilos of milk a day?

   a) 10
   b) 50
   c) 25
   D) 15



8. Pigs usually go to market when they weigh about 100 kilos. How old are pigs when they reach market weight?

   a) 2 years
   b) 6 months
   c) 18 months
   d) 1 year

9. One hog produces how many kilos of bacon?

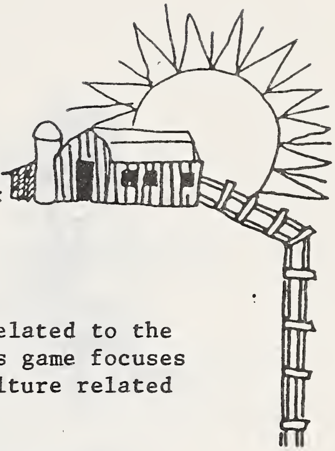
   a) 7
   b) 10
   c) 2
   d) 15

10. What are the measurements of a quarter section of land?

   a) ½ mile x ½ mile
   b) 1 mile x 1 mile
   c) ¼ mile x ¼ mile
   d) ¼ mile x ½ mile

Lesson 23

AGRIBUSINESS GAME



Introduction:

Many Albertan's jobs are related to the Agriculture Industry. This game focuses on the diversity of Agriculture related occupations.

Proceedure:

Preparing to Play the game

1. Ask students if they can name some occupations that are a part of the Agriculture industry in Alberta. Write their suggestions on the board.

2. When the students have exhausted their ideas, read the list of jobs provided with this lesson.

3. Select some jobs from the list to total about 30 - 40 listed occupations.

4. Ask each student to choose an occupation from the job list.

5. Students will list about 10 things that they know or can find out about their job. These are the clues:

The game

i) One at a time, students will go to the front of the class. These students are subjects.

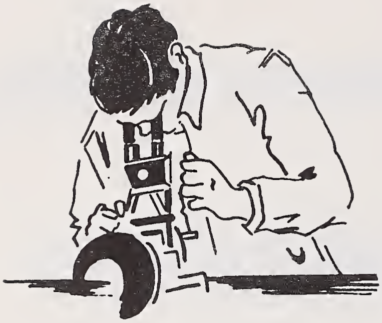
ii) The subject will give the class one clue about their new job.

The class will then bid for the right to guess. Allow 3 bids per round of the game.

iii) Write the names of the bidders and their bid on the board.

Example: "I can name that job in ____ clues."

Note: When a student has made a bid on a round, he/she must wait until the other members of the class have had a chance to bid on a round before he/she can bid again.



iv) The subject continues to give clues about their job until someone guesses their job or they have given all ten clues.

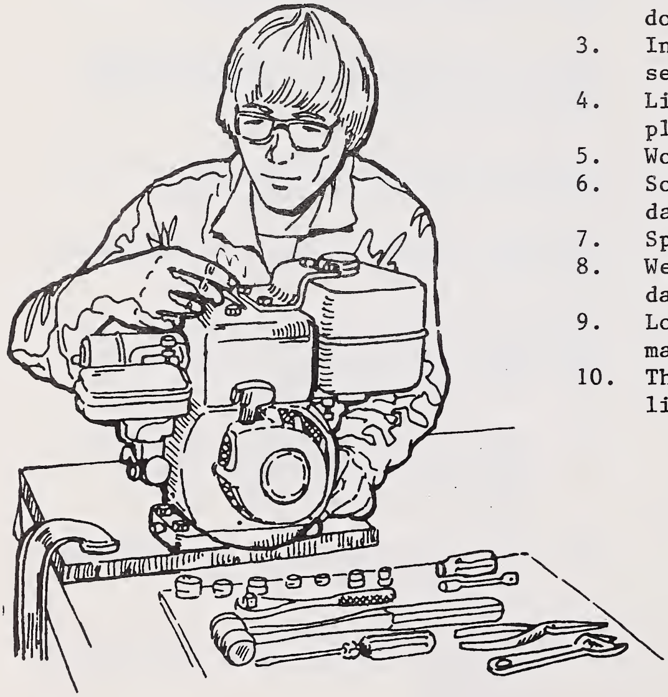
Scoring

1. If the subject's job is not guessed they score 3 points.
2. If the bidder guesses the name of the job within the number of guesses, they receive 2 points.

Example of job and clues:

DAIRY FARMER

1. Job involves a product
2. Much work time is spent out of doors.
3. Involved both in producing and selling the product.
4. Lives and works in the same place.
5. Works closely with animals.
6. Some duties must be done seven days a week.
7. Spends much time with cows.
8. We should drink one quart each day of this product.
9. Looks after both young and mature animals.
10. The product produced is a white liquid.



Occupations Related to the Agriculture Industry

Agriculture Production

- Beef Producer
- Beekeeper
- Broiler Producer
- Dairy Farmer
- Egg Producer
- Feedlot Operator
- Fruit Grower
- Grain Grower
- Greenhouse Operator
- Hog Producer
- Livestock Rancher
- Nursery Producer
- Pedigree Seed Grower
- Sheep Producer

Horticulture

- Floral Designer
- Gardener
- Landscape Designer

Field Crop Services

- Fertilizer and Crop Chemical Salesperson
- Machinery Repairperson
- Plant Breeding Technician
- Seed Testing Technician
- Grain Elevator Agent

Scientific Fields

- Agricultural Economist
- Food Scientist
- Forester
- Plant Scientist
- Animal Scientist
- Soil Scientist

Agricultural Processing

- Butcher
- Cheese Maker
- Dairy Products Tester
- Grain & Flour Miller
- Fruit & Vegetable Grader
- Meat Cutter
- Meat Inspector
- Meat Processing Manager
- Poultry Processing Manager

Animal Health Services

- Animal Health Technician
- Feedlot Technician
- Veterinary Assistant
- Veterinarian

Animal Production Services

- Brand Inspector
- Dairy Inspector
- Feedmill Operator
- Livestock Buyer

Engineering & Equipment

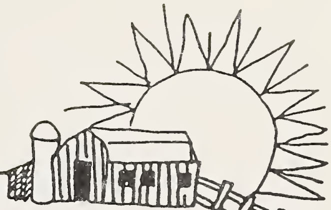
- Building Designers
- Irrigation Engineer
- Livestock Equipment Engineer

Sales

- Farm Machinery Salesperson
- Farm Supplies and Hardware Salesperson
- Feeds Salesperson

Lesson 24

MATH TEASERS



1. A bale of hay weighs 25 kilos. Your new flatbed truck will hold 3 tonnes of hay. (A tonne is 1000 kilos.) How many bales will your truck carry?

2. Potatoes are selling for .12¢ a kilo. Your potatoes are in 40 kilo bags. You have harvested 2,500 bags. How much money will you receive for your potatoes?

3. The herbicide you bought cost $35.00 a litre and one litre will spray 2 acres. What would it cost to spray 16 acres?

4. Your new potatoe digger will dig 18 acres of potatoes a day. If you work a 12 hour day, how many acres an hour are you digging?

5. Your grain bin holds 3,000 bushels of oats. This year you seeded 50 acres to oats. You harvested enough oats to fill the bin. How many bushels of oats did you harvest per acre?

6. You have decided to diversify this year (plant three different kinds of grain), so you plant 20 acres of oats, 35 acres of barley and 60 acres of wheat. If your oat yield is 50 bushels to the acre, barley 40 bushels per acre and wheat 30 bushels per acre, how many bushels of grain will you harvest?

ANSWERS

Lesson 22

Key - Fun Facts

1. d
2. c
3. d
4. a
5. b
6. d
7. c
8. b
9. a
10. a

Lesson 24

Key - Math Teasers

1. 120 bales

2. $12,000.00

3. $280.00

4. 1.5 acres per hour

5. 60 bushels per acre

6. 4,200 bushels

Further

Information

Settlement

By 1870 the buffalo had been driven from the plains and ranchers began to move into the southern grasslands. Soon after, in 1883, the main line of the Canadian Pacific Railway was completed to Calgary and the first immigrants began to pour into the Country. Between 1901 and 1905, when Alberta was incorporated as a province, 40,000 homesteads were granted. A homestead was a grant of land, 160 acres in extent, which could be obtained for the price of $10 and a commitment to make certain improvements during a three-year residence.

Homestead entries for 1913 were over 14,000, an area of 880,000 ha (2.2 million acres) being alienated. The federal and provincial governments which were jointly responsible for homestead policy attempted from the first to get suitable settlers. The census of 1931 gives an idea of their background:

FARMHOLDINGS BY BIRTHPLACE OF OPERATOR

Canada	28%
U.S.A.	22%
Great Britain	17%
Poland and Russia	11%
Scandinavia	5%
Others	17%

From this we see that most of those claiming homesteads were from other parts of Canada or the U.S.A. where they likely had some farming experience. But large numbers came from central and northern Europe where their farming experience in forested country was especially useful in Canada. The figures do not appear to reflect the actual numbers of Ukrainian pioneers whom we know to have been amongst the earliest, some arriving before the turn of the century. It is likely they have been subsumed in another category. The Ukraine as a distinct entity did not exist when many pioneers arrived, so they gave their homeland as Austria, Russia or even Hungary, as the present-day Ukraine was then part of the Austro-Hungarian empire.

In the 1971 Census, Alberta records a total population of 1.6 million. The major groups by country of origin are Great Britain 49%, Germany 17%, Ukraine 9%, Scandinavia 8% and France 6%.

Bad crop years with drought, poor harvesting weather, early frosts, grasshopper infestations and poor grain prices in the years after World War I and the subsequent depression of the early 1930s persuaded many homesteaders to move off the land and resettle on other farms in the newly-opened Peace River country or to live in nearby towns or cities.

The issuing of homesteads without regard to the agricultural potential of the land brought about much human suffering as farmers and their families attempted to sustain themselves under extremely adverse conditions. They faced some difficult problems. When the first traders and settlers came to the prairie provinces there were no weather records. As is now well known the weather of this region is highly variable, not only from week to week, but especially from year to year. Soils of the open prairies were fundamentally different from those the settlers had been familiar with elsewhere. As a result of those unknowns, some extensive areas of land poorly suited to arable agriculture were plowed to raise grain. The tilling practice then used left the land bare when it was cultivated. The combination of aridity, rather low precipitation and high evaporations, and adverse soil characteristics in some areas soon led to poor yields and extensive soil erosion, about which very little was known. By about 1920 soil erosion and poor yields were such serious problems in parts of southern and southeastern Alberta and in southern and southwestern Saskatchewan that study and classification of soils were begun. An indication of the extent of the problem is given in the 1931 Census which describes over 6,000 farms as abandoned or deserted, comprising 567,000 ha (1.4 m. acres) including almost 162,000 ha (400,000 acres) of improved land. In one district in east central Alberta, one-third of all farms were listed as deserted.

The provincial government soon recognized that it could not continue to permit settling of land without considering its long-term productive capacity. Thus Alberta was the first government to undertake an agricultural policy whereby land was inspected before settlement to ensure that at least 50% of the land would be suitable for cultivation.

For the last 30 years, Alberta has had the most advanced alienation policy for land of any province in Canada. This means that stringent conditions are set out under which settlement is allowed.

Helicopter Surveys: In the early 1950's forestry officials in Alberta wanted to make long-term plans for the management and development of the province's forest resources. They were eager to avoid a waste of resources and effort by planning forest activities in areas other than those which might eventually be farmed. The Alberta soil survey was therefore requested to do an exploratory soil survey of the vast areas in the northern half of Alberta which were largely unoccupied and for which there was scant knowledge regarding the soils and agricultural potential. An exploratory soil survey of northern Alberta was therefore made employing aerial photography. The aerial photos were interpreted in the laboratory, and field verification was undertaken by using helicopters to move soil surveyors from place to place throughout the whole of northern Alberta.

The helicopter exploratory soil survey is thought to be the first use of that technique to obtain a broad assessment of land resources in such a huge area as in the north half of the province of Alberta.

COMPARATIVE STATISTICS

		Alberta Census Statistics 1981	Alberta as Per Cent Prairie Provinces	 Canad
Total Population	no.	2,237,724	52.9	9.2
Farm Population	no.	195,284	40.6	18.1
Number of Farms	no.	58,056	37.5	18.2
Total Land Area	ac.	157,710,720	36.3	6.9
Occupied Farm Land	ac.	47,218,170	36.3	29.0
Occupied as % of Total Land	ac.	29.9	--	--
Improved Land	ac.	30,951,142	33.2	27.2
Unimproved Land	ac.	16,267,083	44.0	33.3

CROP AREA 1984
(Principal crops only)

All Wheat	ac.	7,250,000	22.9	22.3
Oats for Grain	ac.	1,200,000	45.8	34.5
Barley for Grain	ac.	5,150,000	50.7	45.8
Canola/Rapeseed	ac.	2,900,000	40.6	39.2
Tame Hay	ac.	3,900,000	55.7	29.4
Summerfallow	ac.	4,700,000	22.8	22.8

Source: Agriculture Statistics Yearbook, 1984. Alberta Agriculture Agdex 853-10

THE CLIMATE: Farming in a northerly latitude in a region with a continental type of climate such as Alberta's is strongly affected by numerous factors such as the frost-free period, precipitation, amounts and dryness of winds, heat units, hours of daylight, and so on.

For large parts of the occupied areas of Alberta, weather records for about 100 years are available and farming has been practiced for 50 to 75 years in the major agricultural areas of the province.

The combination of meteorological data, accumulated farming experience and increasingly detailed knowledge of Alberta soils obtained by soil surveys has enabled the preparation of an agro-climatic map.

The interior location of the province on the continental mass results in greater heating in summer and cooling in winter and in less precipitation than is present in marine areas. Mountain barriers to the west inhibit the flow of mild moist air from the Pacific, ease the flow of cold air from the north in winter, and warm air from the southeast in summer. The warm Pacific and cold Hudson Bay currents contribute to downward southeast to northeast temperature gradients.

Alberta's latitude places the province under the influence of prevailing westerlies aloft at about 6 km (20,000 feet). Migrating low pressure areas, caught in the westerlies aloft, usually cross the province from west to east at the rate of 2 or 3 per week. These weather systems, often called storm centres, lose much of their moisture on the western slopes of the mountains and consequently bring only meagre precipitation to Alberta. Occasionally, however, once it has crossed the mountains such a storm center may intensify significantly and produce widespread rain. In most years three or four of these systems developing in spring of early summer provide the main moisture base for the growing season.

When the winds aloft shift to north or northwest, cooler air masses enter the province from the Northwest Territories. If this happens in winter the result is usually a cold outbreak. Blizzards occasionally accompany such outbreaks. Southerly winds aloft on the other hand are usually accompanied by warm weather, and in summer hot humid air from the central United States can spread into southern Alberta.

Alberta is too far inland to enjoy the moderating influence of the Atlantic Ocean or the Gulf of Mexico. The Pacific Ocean, however, being only 480 km (300 miles) from the western boundary exerts profound influence on the climate. However, the environmental variability is extreme in Alberta, the land being from 240 to 1,200 m (800 to 4,000 ft) above sea level in the plains region and over 2,400 (8,000 ft) in the mountains. Most of the province receives from 300 to 500 mm (12 to 14 in) of annual rainfall as well as a varying amount of snow usually corresponding to some 50 to 150 mm of water. The number of frost-free days ranges from fewer than 60 to over 125 per year.

In the winter cold polar continental air masses which move down over Alberta are frequently modified in the southwest by mild air from the Pacific to which the heat of condensation from heavy snowfall in the mountains and adiabatic heat from the descent down the eastern slope have been added. This produces the chinook wind, which is dry. Rapid melting and evaporation take place during chinooks. A chinook wind can cause a rise of 25 to 35°C in a few hours' time. The significance of the wind for agriculture lies in its ability to clear snow from grazing land, thus allowing cattle to feed in the fields in winter. On the other hand, it has a severe drying effect in spring and summer so contributes to wind erosion. The alternate thawing and freezing of winter chinooks have a detrimental effect on trees, shrubs and forest cover by causing winter kill. Because of the strong winds, strip farming is practised in parts of southern Alberta. This cultural method originated as a result of the joint efforts of Alberta soil scientists and farmers in the 1930s who sought a solution to wind erosion problems in farm fields. Damaging winds are most common with consequent soil erosion, lodging of crops, increased heat requirements for people and livestock, wind chill and visibility changes.

Precipitation

In general, agricultural areas get two-thirds of their annual precipitation in the months of May to September. The annual snowfall contributes roughly one-third of the total precipitation. As a rule of thumb 1 cm of snow equals to 1 mm rain (or 10 in of snow = 1 in of rain).

Snow does not always contribute to the moisture base as it is often evaporated by the chinooks in the south. In the Peace River region, heavy spring runoff wastes much of the moisture from snow. Areas with a likely moisture deficit require utilization of dryland farming techniques. "Moisture deficit" is based on the difference between potential evapotranspiration (if moisture were not limited) and the estimated available moisture (precipitation and soil-stored moisture).

Hail

Parts of Alberta have some of the highest hail frequencies in the world. Hail occurs within 145 km (90 miles) of Penhold on an average of 61 days in a year. Hail activity is greatest between June 20 and August 10. Normally 20% of a year's damage occurs on a single day and 50% on the season's four worst hail days.

The Alberta Hail Project operating out of Penhold is capable of seeding rainclouds as part of a weather modification program intended to reduce hail.

TEMPERATURE: Summer temperatures do not limit crop production in northern areas as much as might be expected since long daylight hours in the north compensate for the lower temperatures e.g. Fort Vermilion has 538 daylight hours in July and a mean temperature of 16°C (61°F), while Lethbridge has 488 daylight hours and a mean temperature of 19°C (66°f). The number of degree days and the frost-free period are especially significant for crop production.

A "growing degree day" occurs when the mean temperature for that day exceeds 42°F by one degree. The total number of growing degree days during a growing season accumulates and indicates the amount of heat available for crop growth. Wheat growing is not considered practical with fewer than 2,000 "growing degrees days" in a year.

The number of days between the last freezing temperature of the spring and the first frost in the fall is the frost-free period. A light frost usually does little harm but a killing frost, defined as -2°C (28°F) usually causes damage. The killing frost-free period is generally 3 to 4 weeks longer than the frost-free period.

(This Land of Alberta - Alberta Agriculture)

FERTILIZER AND HERBICIDES

The use of fertilizer has increased substantially over the past 25 years. The initial acceptance of fertilizers occurred during the early 1950's when the use of fertilizers was in the 45,000 t (tonne) range (30 - 40,000 tons). Fertilizer sales soared to a record of 567,000 t (630,000 tons) in 1976.

The use of fertilizer is affected by the buoyancy of the grain market. For example, when prices were depressed in the late 1960's and early 1970's, the use of fertilizer decreased by about 30 percent. Fertilizer demand rapidly increased as grain prices rose in the 1970's.

The use of fertilizer is also affected by the moisture levels in the soil. If moisture reserves are low, response to fertilizer will be decreased. Farmers may opt for summerfallow to build up moisture reserves for the following year.

Over the past 23 years, fertilizer use in Canada has had a three-fold increase, whereas in Alberta it has increased 17-fold. Alberta's share of fertilizer sales in Canada increased from about 3 or 4% in the early 1950's to approximately 20% in recent years.

As with fertilizer, sales of herbicides tend to be affected by the buoyancy of the grain market. Herbicide sales dropped by 40% when grain prices were depressed in the late 1960's and early 1970's. Sales then recovered and leaped ahead with improved grain prices.

WEED CONTROL: is an important factor in crop production. It is unfortunate that no data are available on the amount of herbicides used in Alberta. Expenditures on herbicides in Canada have increased from $8 million in 1951 to $80 million in 1974. Undoubtedly this dramatic increase in herbicide use is reflected in Alberta as well.

(This Land of Alberta - Alberta Agriculture)

SOIL CONSERVATION

Wind and water are the chief erosion hazards in Alberta. Erosion by wind can be serious in the southwest, particularly in drought years. It is a major concern on the Brown and Dark Brown soils of Alberta in the spring and fall months, and in the chinook belt in the winter. All soils are most vulnerable to drifting in May and June when little plant cover is present to give protection from the wind. Sandy soils in all areas are the most vulnerable.

Prevention centres around the practice of trash-cover farming. It is a system of managing cereal stubble and other plant residues to protect the soil from erosion. Excellent protection is obtained is 1,700 - 2,300 kg/ha (1,500 - 2,000 lb/ac) of trash are maintained on the surface of a fallow field and if much of this cover is carried over on to the seeded field. Spring wheat produces about 45 kg (100 lb) of straw and stubble with each bushel of grain in the Dark Brown soil zone.

In northern Alberta, trash cover for winter protection is also a necessity. Here deep late fall cultivation 13 - 15 cm (5 - 6 in) with some incorporation of the stubble and crop residue is advisable. On sloping, fine textured soil, it is good practice to cultivate across the slope to reduce spring run-off.

One of the tillage machines recommended for use in making trash cover is the wide-blade cultivator, invented by Dr. Noble of Nobleford, Alberta in 1930. It reduces trash cover by only 5 percent each time it is used.

Trash cover farming us usually combined with strip farming which reduces erosion by cutting down the wind's velocity at the soil surface and localizing drifting, thus reducing the cumulative movement of soil. Strip farming is the growing of grain or forage in narrow strips alternating with trash cover fallow. It is a recommended practice in all the drier regions. Strips are at right angles to the prevailing wind.

Shelterbelts are another method of wind erosion control. They decrease wind velocity and result in increased yields on the leeward side.

In moist regions cover crops are used to prevent wind erosion. In sandy areas, seeding to permanent pasture is recommended and on irrigated land, fall plowing is recommended. Soil drifting can be checked by any tillage operation that produces a rough surface with lots of soil clods.

WATER EROSION: This depends on rainfall intensity and amount, soil properties, protective trash and topography. Soil cultural practices that reduce the exposure of bare spoil to rainfall and maintain soil in good tilth, thus increasing the rate of infiltration, will prevent water erosion. Spring run-off while the ground is frozen can be a problem on land with long shallow slopes. If gullies form, they can be sown to grass or put under tree cover.

(This Land of Alberta - Alberta Agriculture)

RURAL POPULATION AND FARM SIZES

From Census Data

	1911	1921	1931	1941	1951	1956	1961	1966	1971
Total Population of province (thousands)	374	588	731	796	939	1,100	1,300	1,500	1,600
Population on farms (thousands)	--	--	375	383	345	332	287	281	239
Percentage rural	--	--	51	48	36	29	21	19	12
No. of farms (thousands)	60	82	97	99	84	79	73	69	62
Area farmed as a % of Alberta's total land area (159 million acres or 63.6 million hectares)	11	18	25	27	28	28	29	30	30
Average area per farm (ha)	116	140	160	172	212	232	256	280	316
Average area per farm (acres)	290	350	400	430	530	580	640	700	790

NET VALUE OF PRODUCTION IN COMMODITY PRODUCING INDUSTRIES ALBERTA AND CANADA 1973

	ALBERTA		CANADA	
	Millions $	% of Total	Millions $	% of Total
Agriculture	1 100	19	5 300	10
Mining (includes petroleum)	2 400	42	5 500	10
Electric Power	165	3	2 500	5
Manufacturing	1 000	17	28 000	54
Construction	1 100	19	9 600	19
Other	20	-	1 100	2
	5 785	100	52 000	100

EMPLOYMENT IN COMMODITY PRODUCING INDUSTRIES ALBERTA 1974

Industry	No. of Workers	% of Total Provincial Labour Force
Agriculture	86,000	12
Mining (includes oil)	26,000	4
Manufacturing	62,000	9
Construction	52,000	7.6

AGRICULTURE AND THE PROVINCIAL ECONOMY

From its inception as a province in 1905, Alberta has been a significant agricultural producing area. As a result of the homestead policies pursued by the federal and provincial governments in the first 30 years of Alberta's history, the number of farms grew rapidly.

But since 1931 the farm population has declined from being over half the total provincial population to being only 10% of that population today.

The trend toward larger farms and the movement off the land has been accompanied by a major shift in the structure of the provincial economy from being basically agricultural to being dominated by mineral development, especially petroleum.

Agriculture, manufacturing, and construction each account for about one-fifth of the value of Alberta's total production. Mining currently is responsible for about 40% of Alberta's commodity production and represents about one-third of Canada's total mining output. Mining includes petroleum extraction.

While no longer responsible for the commodity bringing the most revenue to the province, agriculture still occupies a position of major importance in the economy of Alberta and Canada.

Thus although agricultural production (farm receipts) accounts for only 20% of the dollar value of all goods produced in Alberta, processing and transporting these goods and the sale of chemicals, fertilizer, machinery, providing storage facilities et cetera, which are associated with farm output, provides for a great deal of additional economic activity. In the final analysis about two-thirds of the gross provincial product is agriculture related. The largest of these agriculture related industries is the food and beverage segment which accounts for 39% of the value of all shipments. As well as being the predominant industry in terms of the value of the goods manufactured, the food and beverage industry has the largest number of employees.

(This Land of Alberta - Alberta Agriculture.)

ALBERTA'S CROP PRODUCTION IN A CANADIAN CONTEXT

WHEAT: The prairie provinces have rightfully been designated the bread basket of Canada, producing over 95% of Canadian wheat. About 22% of all Canadian wheat is produced in Alberta and 60% in Saskatchewan. The share of wheat production between provinces has remained fairly constant over the years.

BARLEY: The prairie provinces account for over 95% of Canadian barley production. About half of Canada's barley is produced in Alberta. Over the past ten years, Alberta's share of barley production has increased from 47% to 52%, mainly at the expense of Ontario and Saskatchewan.

Barley production in western Canada is the base upon which the western livestock feeding industry has developed. Production in Alberta has been constantly increasing with less annual variability than noted in Saskatchewan.

OATS: In total dollar value, oats is not an important crop to Alberta or Canada. Although acres seeded have been declining, increases in yields are maintaining stable production levels, more so for Alberta than Canada.

Alberta has increased its share of oats production in Canada from about 30% to 33% in the past ten years.

The prairie provinces presently produce approximately 84% of the oats in Canada.

OILSEEDS: Two main oilseed crops are grown in Alberta; flax and canola. Flax is declining in importance as a crop in Alberta, while canola is increasing in importance to both Alberta and Canada.

The prairie provinces produce more than 98% of the canola in Canada, with Alberta accounting for 38% to 40%.

Flax is losing importance as a cash crop, mainly due to increased canola production. Farmers have tended to substitute canola for flax as an alternative to cereal crops.

Total flax production in Canada, including Alberta, is declining, with Alberta's share of Canada's production also decreasing. In 1976-76, Alberta produced only about 15% of Canada's flax, whereas in the past ten years, it has produced an average of approximately 20% of Canada's flax.

Canola yields have been fairly consistent with an upward trend over the years. However, the acreage seeded varies considerably from year to year. A farmer's decision to grow canola hinges upon markets for other grains, spring climatic factors and price relationships. Canola has provided the prairie farmer with an important alternative to wheat and coarse grains. For this reason it has been called the "Cinderella" crop of Western Canada. Farm cash receipts for canola in Alberta reached a high of about $120 million, or 15% of total cash receipts from the sale of crops in 1974.

TAME HAY: Alberta farmers produce about 20% to 22% of the tame hay in Canada and their annual share of Canadian production is increasing slightly.

Although hay production is not significant as a cash crop, it is extremely important to Alberta farmers in supporting livestock.

Average yields of hay are about 20% lower in Alberta as compared to the Canadian average. This probably relates to the more intensive farming practices and higher precipitation rates in Central and Eastern Canada.

SUMMERFALLOW: Summerfallow acreages for Alberta have remained relatively constant over the years with 2.4 to 2.8 million hectares (6 to 7 million acres) remaining in fallow annually. The practice of summerfallow rises in response to weather and market conditions. When grain markets are poor or prices are low, farmers tend to increase summerfallow as a marketing strategy. For example, in 1954 and 1974, when poor seeding conditions were experienced, summerfallow was increased. In the late 1960's and early 1970's when grain prices were depressed and farmers were encouraged by the federal government to reduce grain acreage through "Operation Lift", summerfallow soared to a record of 3.6 million ha (8.9 million acres) in Alberta.

SUMMARY

Alberta is a major producer of field crops in Canada. The accompanying table gives Alberta production as a percentage of total Canadian production. In addition, Alberta is a major producer of forage crop seeds, and figures showing Alberta's production as a percent of Canada's total production are also given.

CROP	Alberta Production as a % of Canadian Production
Wheat	22
Barley	50
Oats	33
Oilseeds	40
Potatoes	5
Honey	40
Sugar Beets	52
Creeping Red Fescue Seed	74
Bromegrass Seed	53
Alsike Clover Seed	63
Red Clover Seed	22
Alfalfa Seed	52

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LIVESTOCK

CATTLE: Ranching began in Alberta about 100 years ago. It is an industry which has experienced many ups and downs. For the past 25 years there have been three major "cattle cycles" in Canada. The last two (1957 - 1956 and 1969 to the present) have had a deleterious effect on farming communities. Nevertheless, cattle populations have shown consistent increases over the last 25 years. After each contraction and expansion phase, herd inventories have been higher than when the cycle started.

In the 1950's and early 1960's, cattle inventories increased steadily from about 9 million to 12 million head. In the early 1960's, Alberta overtook Ontario as the province with the largest beef herd. The large wheat sales to Russia in the early to mid 1960's and their subsequent termination resulted in an increase in cattle numbers due to excessive grain inventories. These large grain inventories in late 1960 spurred another expansionary phase in the cattle industry. In this latest cycle, the advent of the modern commercial feedlot was seen.

Ontario's producers increased their cow herds and their feeding capacity along with their growing population. This in a large part was due to the development of hybrid corn varieties that revolutionized Ontario's crop production.

Cattle slaughtering in the west increased over the last 25 years, and within the last 10 years Alberta has surpassed Ontario. A considerable number of feeder cattle are still being sent east and to the U.S. for finishing.

With improved technology such as boxed beef, and with a hope for a change in tariff rates, transportation and quotas, the future of Alberta's livestock industry appears bright. For the last 25 years, Alberta's share of Canadian cattle slaughtered has increased from 17% to 43%.

Quality of Alberta meat is well above the Canadian average with 75% of the animals slaughtered being graded as A-1. Beef processing is the province's largest food processing industry. In 1976, the out-of-province shipments of beef accounted for $428 million. In Edmonton in 1974 over 3,000 persons were employed in slaughtering and processing meat and the payroll of this industry was bigger than that of any other manufacturing industry in the city.

About one quarter of the live cattle in Canada are on Alberta farms. Although Alberta will expand its production base relative to the rest of Canada, future growth patterns will still be very dependent on the ratio of cattle prices to feed-grain prices.

HOGS: Hog production in Canada is also affected by cycles. The hog production cycle generally peaks every three to five years.

Western Canada in general, and Alberta in particular, maintains a hog industry based primarily on barley and other grains. When the price and movement of barley is such that a greater return on the barley can be achieved by producing hogs, this is done.

Eastern Canadian hog cycles are not as pronounced as in the west. This is mainly due to a more capital-intensive method of agricultural production and a smaller land base per farm.

Alberta has sought to develop market alternatives by developing export contracts for hogs. Although this presented hog producers with an excellent form of price security, production still declined from marketings of over two million hogs in 1971 to about one million in 1976. This drop was caused primarily by high grain prices and a good market demand for grain. Although eastern Canada did experience a period of low profitability, the drop in eastern hog production was not as severe.

The effect of Alberta's reduction in hog production has been a reduction in the number of hog processing facilities. The packers did this in order to reduce costs. The result will be an extra expense for Alberta producers in transporting hogs.

ALBERTA'S DAIRY INDUSTRY - 1952 - 1977

In the past 25 years Alberta's primary dairy industry has changed from thousands of small production units to a concentration in the hands of fewer, more efficient producers with larger herds. While per capita consumption of dairy produce has dropped 25% in the past 25 years, because of Alberta's expanding population, total milk production in 1976 was approximately the same as in 1952. Alberta is self-sufficient in production of fluid milk but has shifted from having a surplus of butter and other dairy products to being a net importer. Alberta's share of factory production has declined to 78% of consumption levels due to the inability of the industry to expand production rapidly enough to meet domestic requirements.

PER CAPITA CONSUMPTION TRENDS: In 1952 the average Canadian consumed 450 kg (1,000 lb) milk as fluid and dairy products. By 1976 per capita consumption dropped 25% and is still declining. Fluid milk consumption, including cream, has dropped by one-third, and butter consumption by almost one half. Per capita consumption of concentrated whole milk products has dropped by half also. Of all the dairy products, only ice cream and cheese have seen an increase in consumption.

ALBERTA DAIRY COST TRENDS: The average price received per 44 litres (hundred-weight) of fluid milk has increased by 161% over the last 15 years, while the production cost has increased by 207%. The changes in price and the cost were not always consistent over the years, causing fluctuations in the return to management.

POULTRY

The improvements and developments in commercial broiler and egg production technology in the 50's revolutionized the indusrty. Per capita consumption of poultry has doubled over the last 25 years. The fast-food outlets which sell fried chicken have contributed to our increased consumption.

To offset price variables, marketing boards were formed to stabilize supply.

Turkey production in Alberta is still in excess of consumption, the surplus moving out of the province.

The increase consumption of chicken indicates an expanding market for broiler producers. Alberta now produces 9% of the Canadian broilers as opposed to 7.5% ten years ago.

EGGS: The production of eggs has also undergone a revolution in technology over the past 25 years, with most small scale producers being forced out of the business. Today eggs and poultry meat account for about 4% of total Alberta farm receipts, i.e. over $65 million as opposed to $20 million worth in 1951.

Egg consumption is declining all over Canada, and egg production was down by 5% in Alberta in 1976. The Canadian Egg Marketing Agency, established in mid-1975, reduced domestic supplies of eggs to marketable levels, and has improved the returns to farmers. However, only a moderate growth in egg production can be expected in the future.

HONEY

Alberta produces about 11.25 million kg (25 million pounds) of honey each year. This is around 40% of Canada's total production. About two-thirds of Alberta's honey is exported, chiefly to the U.S.A. and in lesser quantities to Japan and Germany. The value of this honey in 1977 was estimated to be from $8 to $10 million.

There are opportunities for expansion in the north central part of the province where long daylight hours make honey production feasible. The pollinating capacity of bees has not been fully exploited in that area in relation to seed production, especially of clover so further expansion is desirable and practical.

As with most crops, about 85% of the total production comes from 10% of the producers. In 1976, Alberta produced 9.2m kg (20.5 million pounds) of honey or 37 percent of the total Canadian honey crop.

The following table indicates the size of the Alberta industry.

ESTIMATED PRODUCTION AND VALUE OF HONEY IN ALBERTA, 1965-74, 1974, 1975 AND 1976

	Average 1965-74	1974	1975	1976
Beekeepers, No.	1,347	1,800	2,000	2,000
Colonies, No.	123,400	156,000	158,000	160,000
Average Yield per Colony, (lb)	149	115	88	128
(kg)	67.05	51.75	39.6	57.6
Total Production, (lb)	18,360,000	17,940,000	13,904,000	20,480,000
(kg)	8,262,000	8,073,000	6,256,800	9,216,000
Value of Honey and Wax, ($)	4,230,000	7,654,000	5,765,000	7,841,000

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LAND OWNERSHIP IN ALBERTA 1972

Ownership Category	km^2	Square Miles	Percent
Federal Jurisdiction			
National Parks	53,800	20,692	8.10
Indian Settlements	6,531	2,512	0.98
Military Areas etc.	7,600	2,923	1.14
	68,000	26,127	10.23
Provincial Jurisdiction			
Provincial Parks	6,104	2,348[1]	0.91
Wilderness Areas	6,323	2,432	0.95
Special Areas	14,560	5,600[2]	2.19
Metis Colonies	5,231	2,012	0.78
Forest Land	277,560	106,754	41.81
Swamp, rock, muskeg, & water	50,073	19,259	7.54
	359,853	138,405	54.22
Privately Owned	229,840	88,400[3]	34.63
Miscellaneous			
Roads and Highways	4,636	1,783[4]	0.70
Cities and Towns	1,482	570	0.22
	6,117	2,353	0.92
Total Area	663,741	255,285	100.00

Source: Assembled from various sources.

1. Includes Willmore Wilderness Park and Historical Sites.
2. 75% of the total Special Areas.
3. 25% of the Special Areas is included.
4. In Technical Report 3, Alberta Land Use Forum

* Technical Report 6, Alberta Land Use Forum, 1974.

HISTORY OF LEGISLATION WHICH AFFECTED THE LAND USE IN ALBERTA

The first instance of assigning land to a particular use in Alberta was the granting in 1670 to the Hudson Bay Company the exclusive right to all the land in western Canada for the purpose of fur trading. Title to these lands was only transferred back to Canada in 1870, after confederation. The government of Canada then made grants of land in western Canada to railway companies as an inducement to build the transcontinental railroads, and large areas of the western provinces were made available for colonization under the Homestead Act.

The policy of both the federal and provincial governments after 1905 was to get the land in the west populated as quickly as possible, and little attention was paid to the quality of the land made available. That some of the land was unsuitable became clear when more and more settlers were forced to abandon their homesteads. To prevent future cancellations, a system of agricultural leases was instituted, followed by a system under which land was inspected before it was made available for settlement. Alberta was among the first jurisdictions to establish criteria for land alienation.

In 1905, land ownership in the province of Alberta carried with it most of the rights to use the land as the owner wished. The government retained the right of taxation, mineral rights, and limited rights of eminent domain.

The rapid growth of villages and towns in Alberta made the passing of a planning act necessary to effect orderly development. A brief history of planning in the province is taken from the Land Use Forum Technical Report No. 9:

> "In Alberta, planning legislation began in 1913, and new acts were passed in 1922 and 1928, with zoning beginning in 1929 when the Town Planning Act was passed."
>
> "The crises of the 1930's led to rural land-use planning and during this period the Prairie Farm Rehabilitation Act was passed in 1935, the Special Areas Act of Alberta in 1938, and the Agricultural Service Board Act in 1945. Numerous amendments to the 'Town Planning Act' were made in the thirties until a major revision took place in 1942. The radical change, however, occurred in the amended act of 1950, when interim development control was introduced, as well as provisions for the formation of District Planning Commissions. Thus a clear recognition was made that land use planning was not something which could be confined within a local municipality, but was rather interrelated with outside areas and development."

From the above, it will be seen that common law, borrowed by Canada from the British, is basic to the development of planning in

Alberta. Under common law, land which is owned by individuals may be used only within the constraints laid down by legislation. The owner of the land is considered its custodian and his use of it must not have a detrimental effect on the surrounding property of the community at large, and is subject to the many restrictions thereon. These restrictions may be municipal or provincial in origin. Amongst the provincial legislation which affect agriculture are the following:

1) The Coal Conservation Act gives authority to the Energy Resources Conservation Board to decide which deposits may be mined. This has special significance for agriculture as large deposits of coal are to be found throughout central Alberta. There is also a coal development policy for Alberta which sets out guidelines for coal development on agricultural lands subject to appropriate environmental and reclamation controls.

2) The Land Surface Conservation and Reclamation Act outlines the terms under which approvals for mining operations are allowed, and designates responsibility for cleaning up after exploration and development, and returning the land to productivity. This is of importance to agriculture in cases where land may be adversely affected by extractive operations.

3) The Oil and Gas Conservation Act gives the Energy Resources Conservation Board the authority to allow drilling for oil and gas and locating pipelines.

4) The Surface Rights Act stipulates the conditions which must be met before an exploration or development company may enter private land.

5) The Irrigation Act sets out the administrative machinery which deals with all aspects of irrigation in the province.

6) The Water Resources Act gives the Crown authority over the development of all water diversion and storage developments. The act gives the minister power to make decision on the location of dams and reservoirs for irrigation, power generation, re-creation, etc.

7) The Public Lands Act regulates planning on public lands. The terms under which Crown lands may be used for pasture would be determined by this act.

In addition to these legislative and regulatory restrictions on development, there is a Local Authorities Board which acts as a quasi-judicial body enabled by legislation to make decisions on such matters as the annexation of a tract of land by a municipality. The municipality might then develop the land for urban use. As the annexation of land for purposes of urban expansion, establishing airports of public institutions, or the location of an industrial complex is often at the expense of agricultural land, or land deemed to have value for recreational purposes, conflicts have arisen. In order to make long-range plans, the province set up a Land Use Forum, which after hearing public opinion, reported in 1977. Subsequently the province passed a new planning act.

In general it can be said that key decisions as to the location of urban or industrial development are taken by the cabinet, e.g. whether to proceed with an oil sands plant at Fort McMurray, a petrochemical development at Red Deer, or the decentralizing of a government department. Communities can direct development which such decisions entail by means of zoning which would be determined by the general plan, local opinion is solicited and given consideration. Such a general plan must accord with a regional plan. Regional planning is designed to guide development of a number of communities. The regional plan established general land use classes for the region and designates the permissible uses and densities within each of these classes.

Since expansion for rural and urban residential purposes is responsible for the removal of most agricultural land from production,, the subdivision process has special significance for agriculture. The subdivision process is governed by the planning act. A proposal for subdivision is put before the appropriate board or commission and it is reviewed to see if it conforms to existing plans for the site, taking all factors into consideration. If approved the plan is endorsed.

Subdivision of land for country residential purposes is restricted on class 1 - 3 land and industrial development is usually directed to class 3 land at best. The province has also established restricted development areas around cities to provide space for utility lines etc. In effect this may provide for the continuing use of this land for agricultural purposes.

There is concern nevertheless at the amounts of land in each CLI class which have been taken out of agricultural production in Edmonton and Calgary.

In addition to losses due to urban expansion, agricultural land may be lost to production as a result of planning decisions which result in highway or freeway construction which facilitate an increase in country residential living along the route.

Within that part of Alberta which is farmed, there are areas more favorable to certain kinds of production that others, e.g. parts of south-central and southwestern Alberta have an advantage in row crop production, however, compared to British Columbia and Ontario which have unique fruit growing areas, Alberta's crop potential is relatively limited.

Maintaining the productivity of good agricultural land is the responsibility of the provincial government which undertakes the planning necessary to reduce losses due to erosion or increasing salinity in the case of irrigated lands.

Having farm land available to young beginning farmers has been a concern of many rural organizations. Earlier in this publication rising land costs were shown to be a significant factor in crop production, in addition they present a particular burden to the beginning farmer. In order to limit the competition for farm land from foreign buyers, the provincial government passed legislation in 1977 which restricts ownership of farm land to landed immigrants.

CANADIAN LAND RESOURCES: A comprehensive inventory of land requirements in Canada is not yet completed. Such an inventory should include data on climate, geology, vegetation, soil, landform, water, wildlife, and current use of the land. The existing CLI inventory rates the land capacity for agriculture, forestry, recreation or wildlife, but it covers only the settled areas of Canada, which are about 20 percent of the Canadian land area. Organic soils are not included, although they do have potential for production of certain crops. An Alberta Land Inventory is being prepared. It will deal with those areas not covered by the Canadian Land Inventory.

A national system of land evaluation is presently being prepared. According to CLI data, only seven percent of Canada's land is suitable for pasture. Most of the potential new farmland in Canada is in Alberta, but because of climatic factors, would be only marginal for field crops. Bringing this land into production would be costly and the productivity per unit of energy consumed would be much lower than that of good soils in climatically favorable areas.

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